# SERVICE MANUAL

DC Inverter Split Air-Condition Unit

# Table of Contents


1. The model and the air conditioning unit parameters.....

2. Units operating working conditions and temperature range .....

3. Units characteristic.....

4. Indoor and outdoor units size.....

5. Indoor and outdoor unit explosion diagram and spare parts list .....

6. The analysis of indoor malfunction code.....

7. The analysis of the complete units malfunction code.....

# 1. The model and the air conditioning unit parameters

## 1.1 the model.

DC Inverter Dual series

CMV-50V9A-S

CMV-V64T9AD

## 1.2. the air conditioner's parameter.

| Model | | | CMV-50V9A-S | CMV-V64T9AD |
|---|---|---|---|---|
| Function | | | Heat Pump | Heat Pump |
| Rated Voltage | | | 208-230 VAC | 208-230 VAC |
| Rated Frequency | | | 60 Hz | 60 Hz |
| Circuit Breaker Size | | | 20A | 30A |
| Rated Current (RLA) (Heating/Cooling) | | | 6 / 6.7 A | 8 / 8.7 A |
| Refrigerant (lbs) | | | R410A / 3.88 | R410A / 6.61 |
| outdoor | Cooling | Rated Capacity (Btu) | 18,000 | 24,000 |
| | | Capacity Invert Range (W) | 5000（1650-7100） | 6400（1750-8300） |
| | | Input / Actual Input (W) | 1380/1450 | 1830/1882 |
| | | Max. Power (W) | 2420 | 2990 |
| | | Max Current (A) | 10.5 | 13 |
| | | SEER | 14.8 | 15.6* |
| | Heating | Rated Capacity (Btu) | 22,000 | 25,000 |
| | | Capacity Invert Range (W) | 5800（1790-7800） | 7200（2000-8400） |
| | | Input / Actual Input (W) | 1,550 / 1,580 | 2,000 / 2,060 |
| | | Max. Power (W) | 2579 | 3,200 |
| | | Max Current (A) | 11.3 | 13.9 |
| | | Declared COP / Actual COP (w/w.h.) | 3.75 / 3.65 | 3.5 / 3.4 |
| | Fan Motor | Model | YDK-60A-6C | YDK-60A-6C |
| | | Input (W) | 196 | 196 |
| | | Capacitor (UFD) | 4 / 450 VAC | 4/ 450 VAC |
| | | Fan Motor FLA (A) | 0.98 | 0.98 |
| | | Fan Speed (RPM) | 900/750/500 | 900/750/500 |
| | Outdoor Fan | Fan Type | Axial | Axial |
| | | Fan Blade Diameter (in) | 18.1 | 18.5 |
| | | Air Flow Volume of Outdoor Unit (CFM)(M^3/h) | 2800 | 3200 |
| | Compressor | Model | C-6RZ146H1A | C-7VRN153HOW |
| | | TYPE | DC | DC |
| | | Brand | Sanyo | Sanyo |
| | | Capacity (W) | 6420 | 7110 |
| | | Input (W) | 1635 | 1770 |
| | Condenser | Tube Pitch x Row Pitch | 1 x .866 in | 1 x .866 in |
| | | Fin spacing | 0.0708 in | 0.0708 in |
| | | Fin Type | Louvered Fin | Louvered Fin |
| | | Tube Outside Dia. and Type | 0.375" Rifled Tube | 0.375" Rifled tube |
| | | Coil Length x Height x Width | 28.66 × 25.6 × .988 | 31.57 × 31.96 × .866 |
| | | Number of circuits | 4 | 4 |
| | Dimensions | Unit Dimensions (W x H x D) (in) | 36.5 x 14.25 x 27.6 | 35.43 x 13 x 32.08 |
| | | Packing dimensions (W x H x D) (in) | 39 x 16.14 x 30.32 | 40.55 x 17.32 x 34.65 |
| | | Net / Gross Weight (lb) | 114.64 / 123.47 | 143.3/158.73 |
| | Connection | Design Length | 16.4' | 16.4' |
| | | Max Line Set Height | 16.4' | 16.4' |
| | | Max Line Set Length | 49.21' | 49.21' |
| | | Charge over Design Length | 0.20 oz / Ft. | 0.20 oz / Ft. |
| | | Connection Pipes | 1/4" / 3/8" | 1/4" x 1/2" |
| | | Design Pressure (PSI) | 623.66 | 623.66 |

# 2 RATING CONDITIONS and Operating Limits

## 2.1 RATING CONDITIONS

Standard conditions in accordance with ANSI/AHAM RAC-1-2003, and UL 484.

**Cooling:**

Indoor: 80°FDB 67°F WB

Outdoor: 95°F DB 75°F WB

**Heating:**

Indoor: 70 °F DB 60 °F WB

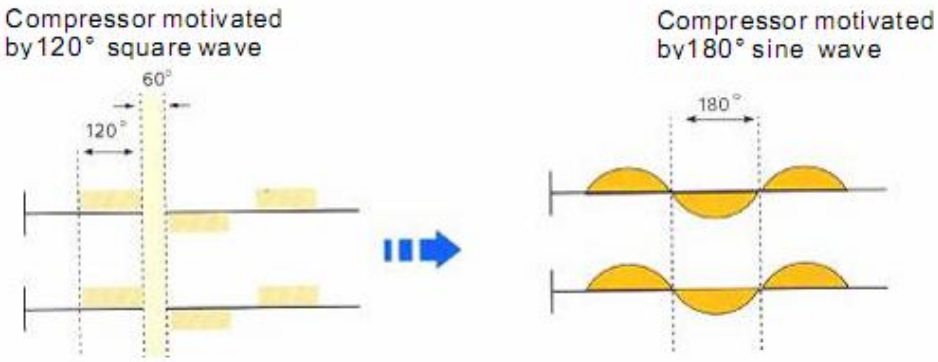
Outdoor: 47°F DB 43 °F WB

## 2.2 Operating Limits

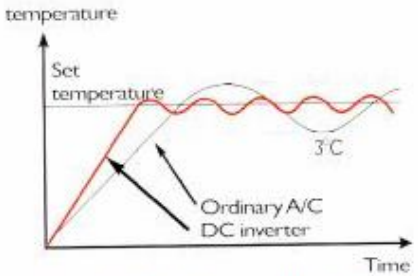
| | | Outdoor |
|---|---|---|
| **Cooling** | Upper limit (DB) | 110 °F |
| | Lower limit (DB) | 5°F |
| **Heating** | Upper limit (DB) | 75 °F |
| | Lower limit (DB) | 5°F |
| **Voltage** | 1PH | 230V |

## 3、Units characteristic

☆ R410a
☆ Low noise level
☆ Wide operating range with outdoor air temperatures, cooling:5-46℃,heating:-15-24℃
☆ High efficiency and energy saving
☆ Air filters easy to remove and clean
☆ Twin rotary compressor
☆ Auto-restart after a power supply blackout
☆ Single-phase power supply thanks to DC inverter technology low consumption
☆ Dynamic refrigerant control by DC inverter compressor and circuit, electronic valve and fuzzy logic managed by a powerful micro program
☆ EEV for each indoor unit




We leaded to adapt 180°sine wave with permanently magnetic and synchronized brushless motor, compressor motivated from 120°square wave control to 180°sine wave. These contribute higher efficiency, lower power consumption and noise.




Compared with the on/off unit, DC inverter has the advantage of fast refrigeration of calefaction, accurate temperature control, reliable system, high efficiency and so on.

High precision of flow valve, with large range of flow, accurate control, these could implement automatically control to refrigerant and help system always run at the best condition.

## Energy-saving

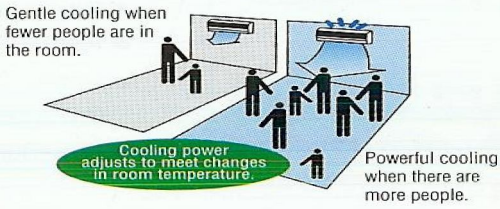
For optimum use of limited energy resources, an inverter air conditioner features an inverter circuit providing extremely efficient operation. So even though you get speedy, flexible operation, you use less electricity. What's more, low energy consumption means operation that's more environment-friendly than ever.

Flexible power control & Energy saving

The graph shows the CS-E21EKU's wide power output range during heating.

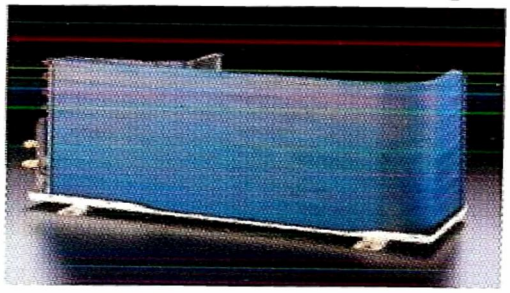
## Flexible power control

You're always comfortable with an inverter air conditioner. After quickly reaching the set temperature, it finely adjusts output power to maintain a constant temperature. So there are no uncomfortable temperature swings, while electricity is used more efficiently. Broad output power capability also assures continued comfort even if the number of people in a room changes.


Gentle cooling when fewer people are in the room.
Cooling power adjusts to meet changes in room temperature.
Powerful cooling when there are more people.

## Anti-Corrosion Condenser

Condensers can take a beating from exposure to salty air, rain and other corrosive factors.
Chigo has lengthened the life of our condensers with our new anti-rust coating.



## Round form

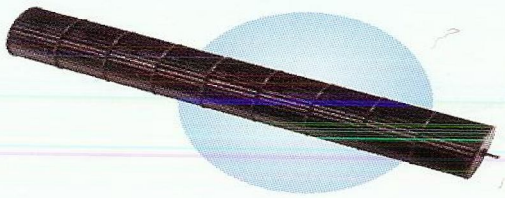
The white body and sleek design have a pleasant, hygienic appearance.

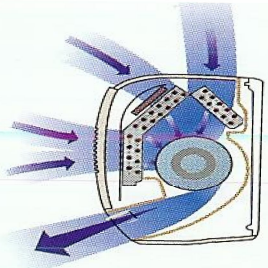
## Removable, Washable Panel

The front panel is easy to keep clean.
It removes quickly with a simple one-step operation and can be washed in water.

## Cross-Flow Fan

The Excelent air flow path is due to the exceptionally wide diameter of our cross flow fan.
This maintains super-quiet operation while the increased airflow sends clean, comfortable air to every corner of the room.

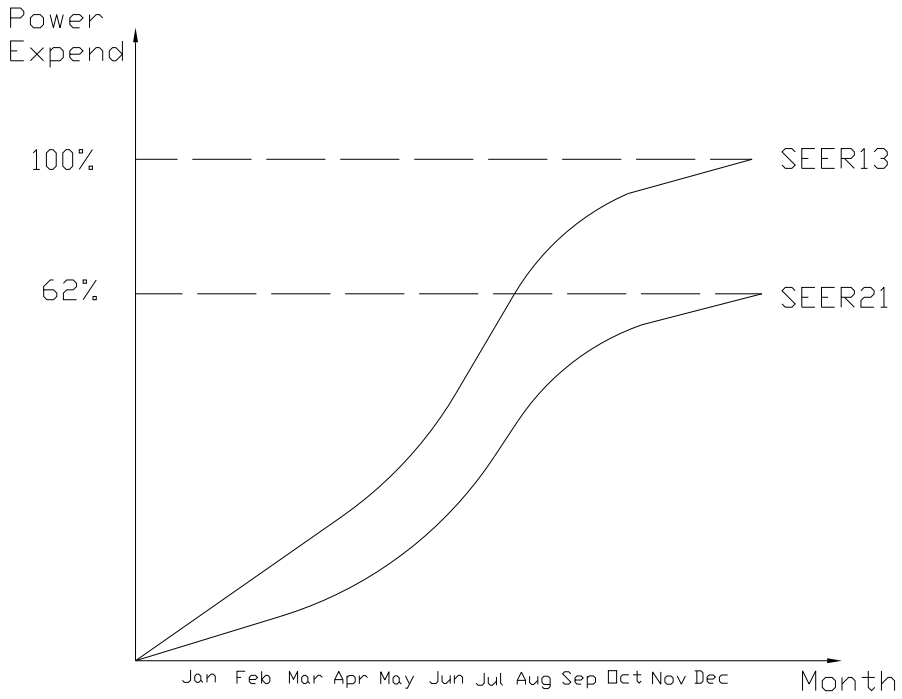




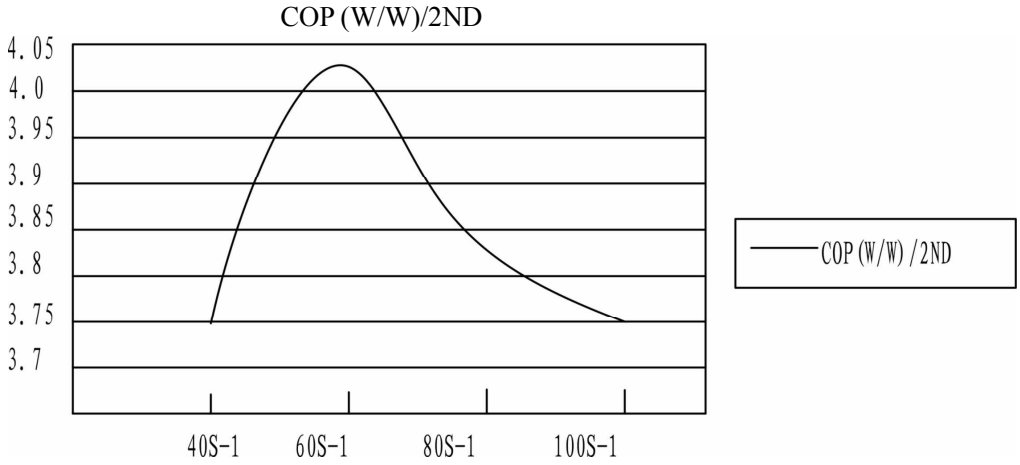
## Double-Bend Heat Exchanger

This structure gives the heat exchanger a large surface area for higher efficiency. With 15 rows of copper piping, the double-bend heat exchanger helps to ensure the air the unit takes in will be cooled or heated, resulting in high heat exchange efficiency.

**The new CMV is a high efficiency DC inverter technology outdoor unit，it can save electricity 62 % every year.**




**The compressors energy consumption graph .**



**The compressor's condensing pressure graph .**

# APPENDIX

・For DC Inverter Compressors the following shall be strictly obeyed.

## 1. Prevention of motor demagnetizing

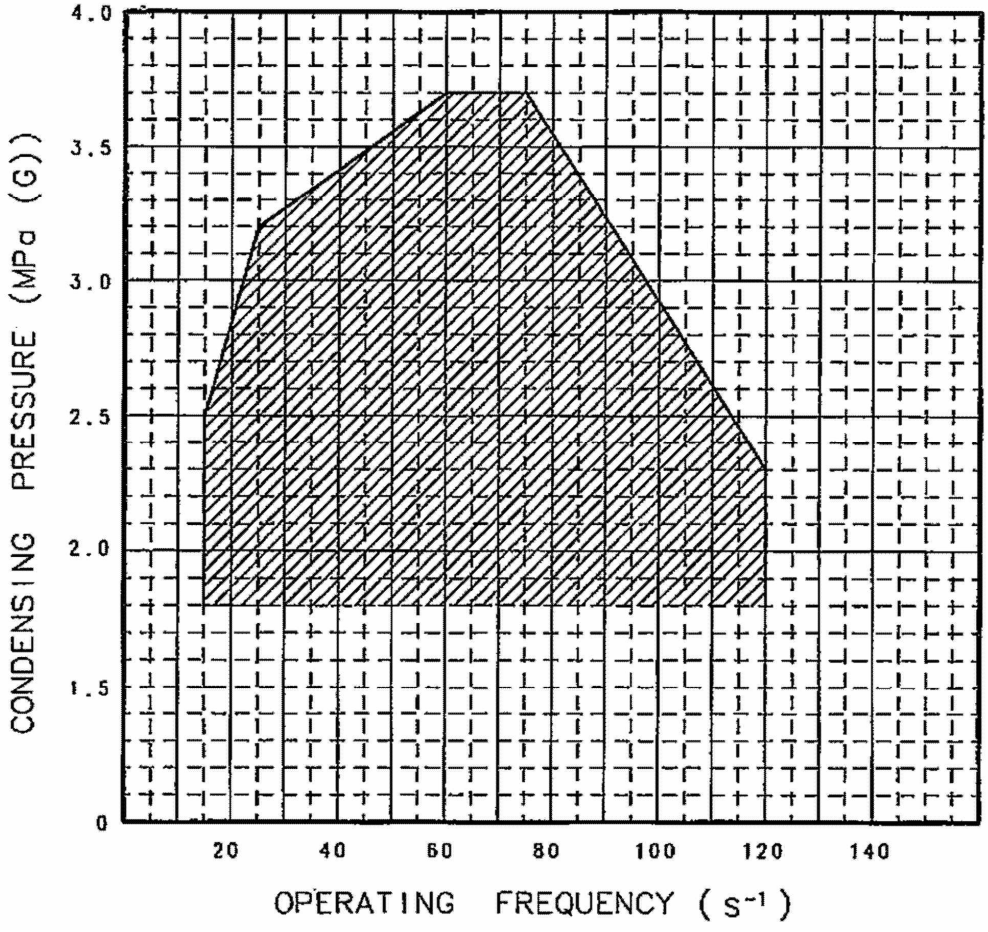
1-1. Peak Current of Motor : 48 A Max.

* Never exceed for a moment.

1-2. Discharge Temp. : 110 °C Max.

## 2. Compressor Revolution & Condensing Pressure (Reference)

The compressor shall be operated under the diagonal conditions.



**Cooling Capacity (BTU)---Run Model,230V,Indoor fan at high speed**

| INDOOR ENTERING AIR DB/WB TEMPERATURE [$^0$F] | | | | | | |
|---|---|---|---|---|---|---|
| **OUTDOOR ENTERING AIR DB TEMPERATURE[$^0$F]** | **DATA** | **72/59** | **75/63** | **81/66** | **84/70** | **90/73** |
| **14~68 (protection range)** | TC | 80 - 110 % of nominal | | | | |
| | SC | 80 - 105 % of nominal | | | | |
| | PI | 25 - 50 % of nominal | | | | |
| **77** | TC | 11616 | 12336 | 13104 | 13872 | 14640 |
| | SC | 10421 | 10603 | 10845 | 11027 | 11269 |
| | PI | 0.72 | 0.73 | 0.75 | 0.76 | 0.77 |
| **86** | TC | 11040 | 11808 | 12576 | 13296 | 14064 |
| | SC | 10118 | 10361 | 10542 | 10785 | 10966 |
| | PI | 0.81 | 0.82 | 0.83 | 0.85 | 0.86 |
| **95** | TC | 10464 | 11232 | 12000 | 12768 | 13536 |
| | SC | 9876 | 10058 | 10300 | 10542 | 10724 |
| | PI | 0.88 | 0.90 | 0.92 | 0.93 | 0.94 |
| **104** | TC | 9936 | 10704 | 11424 | 12192 | 12960 |
| | SC | 9634 | 9815 | 10058 | 10239 | 10482 |
| | PI | 0.97 | 0.98 | 0.99 | 1.01 | 1.02 |
| **115** | TC | 9264 | 10032 | 10752 | 11520 | 12288 |
| | SC | 9270 | 9512 | 9694 | 9936 | 10118 |
| | PI | 1.07 | 1.08 | 1.09 | 1.11 | 1.13 |

**Heating Capacity (KW)---Run Model,230V,Indoor fan at high speed**

| ID COIL ENTERING AIR DB TEMPERATURE [$^0$F] | | | | |
|---|---|---|---|---|
| **OD COILENTERING AIR DB/WB TEM PERATU RE[$^0$F]** | **DATA** | **59** | **68** | **77** |
| **5/3** | TC | 8960 | 8260 | 7700 |
| | PI | 0.66 | 0.73 | 0.80 |
| **14/10** | TC | 9940 | 9240 | 8680 |
| | PI | 0.80 | 0.87 | 0.95 |
| **20/18** | TC | 10640 | 10080 | 9380 |
| | PI | 0.91 | 0.97 | 1.04 |
| **30/28** | TC | 11060 | 10500 | 9800 |
| | PI | 0.96 | 1.02 | 1.08 |
| **36/34** | TC | 11340 | 10640 | 10080 |
| | PI | 0.99 | 1.06 | 1.12 |
| **45/43** | TC | 14560 | 14000 | 13440 |
| | PI | 1.04 | 1.11 | 1.18 |
| **50/48** | TC | 15400 | 14840 | 14140 |
| | PI | 1.11 | 1.18 | 1.25 |
| **59/54** | TC | 16240 | 15680 | 14980 |
| | PI | 1.16 | 1.22 | 1.30 |
| **59~75 (Protection Range)** | TC | 85 - 105 % of nominal | | |
| | PI | 80 - 120 % of nominal | | |

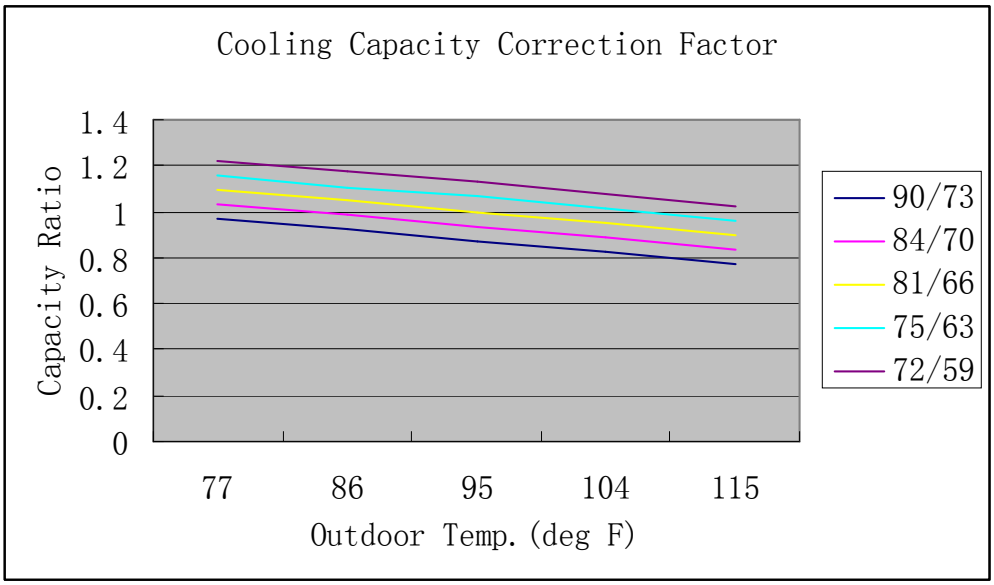
**LEGEND**

TC – Total Cooling Capacity, BTU SC – Sensible Capacity, BTU PI – Power Input, kW

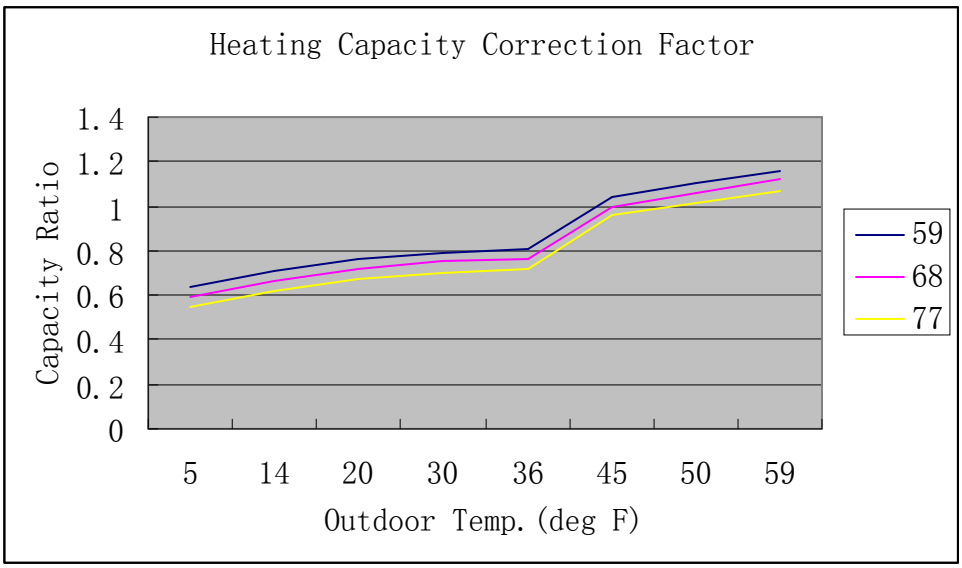
WB – Wet Bulb Temp., ($^0$**F**) DB – Dry Bulb Temp., ($^0$**F**) ID – Indoor OD – Outdoor

**Capacity Correction Factors**

**Cooling Capacity Ratio Vs. Outdoor Temperature**

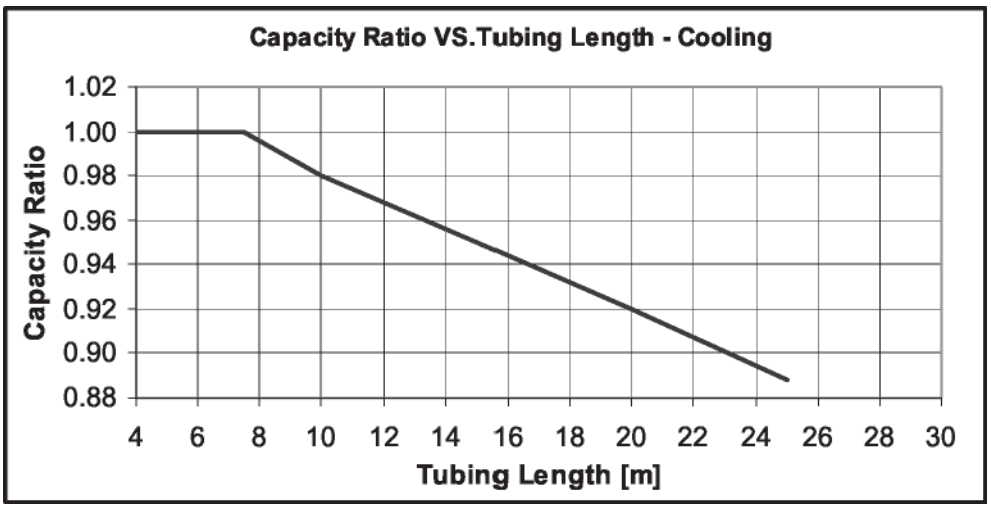



**Heating Capacity Ratio Vs. Outdoor Temperature**

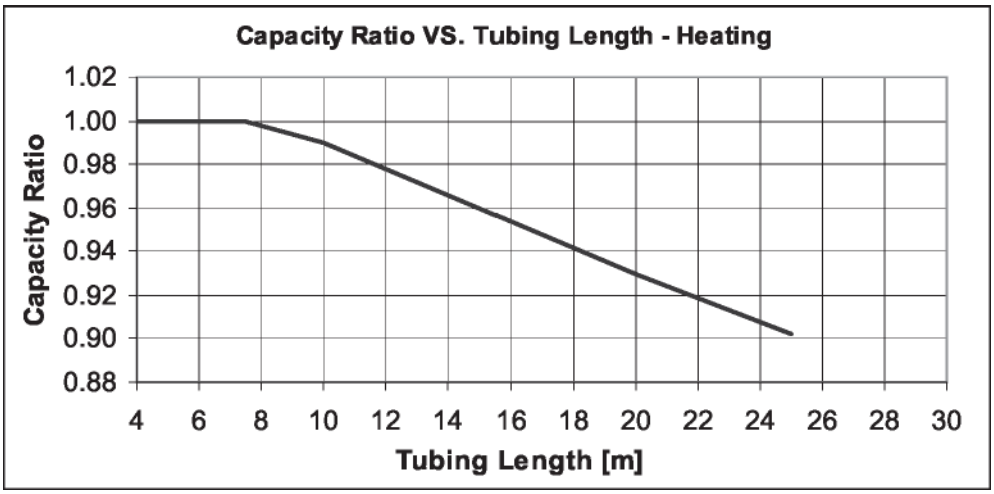


## Capacity Correction Factor Due to Tubing Length (One Way)

### Cooling

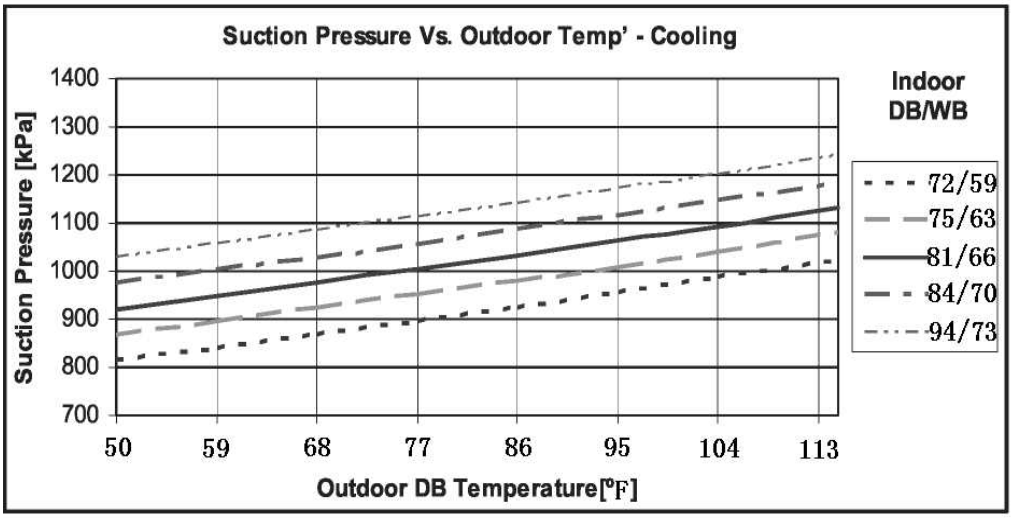



### Heating

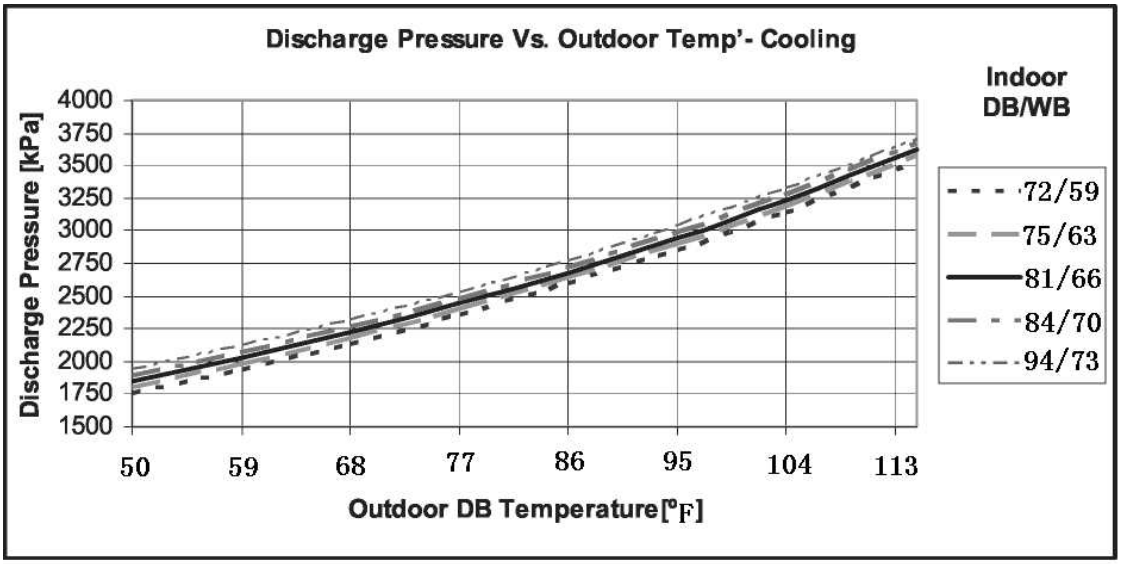


# Pressure Curve

## Suction Pressure Curve




## Discharge Pressure Curve



## ELECTRICAL DATA

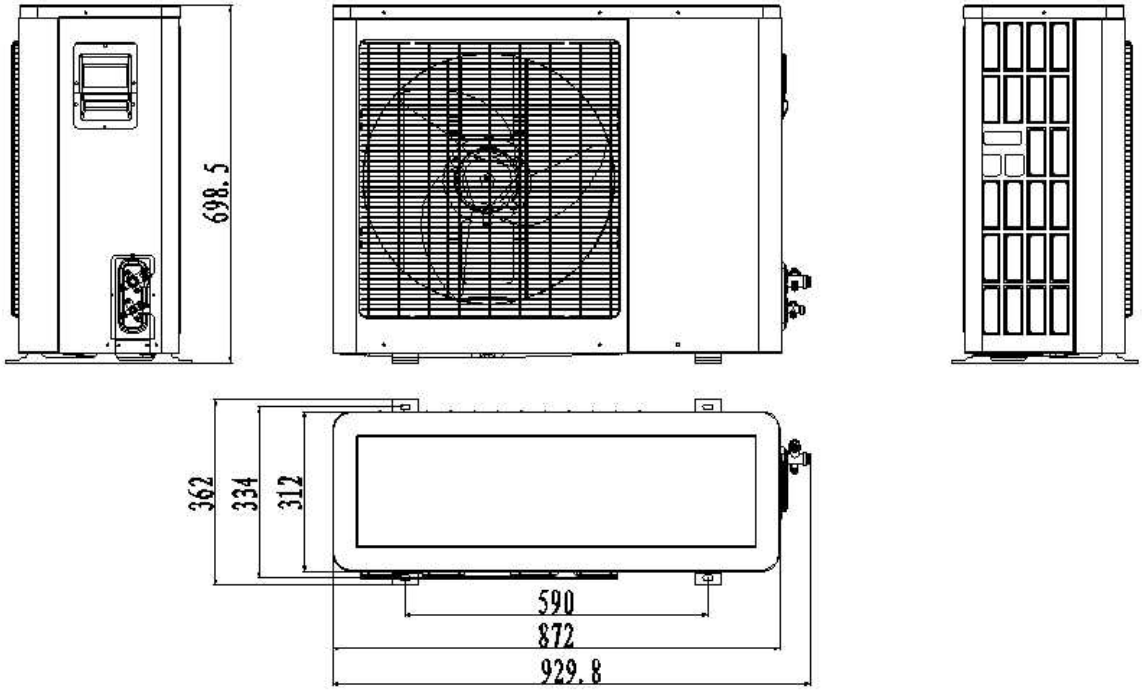
| Model | CMV-50V9A-S |
|---|---|
| Power Supply | 1 PH, 230VAC,60Hz |
| Connected to | Outdoor |
| Maximum Current | 11.3A |
| Inrush Current | 40A |
| Starting Current | 1A |
| Circuit breaker | 20A |
| Power supply wiring - No. x cross section | 1 X 3 X 2.5 $mm^2$ |
| Interconnecting cable - No. x cross section | 2 X 4 X 1 $mm^2$ |

| Model | CMV-V64T9AD |
|---|---|
| Power Supply | 1 PH, 230VAC,60Hz |
| Connected to | Outdoor |
| Maximum Current | 13.9A |
| Inrush Current | 40A |
| Starting Current | 1A |
| Circuit breaker | 20A |
| Power supply wiring - No. x cross section | 1 X 3 X 2.5 $mm^2$ |
| Interconnecting cable - No. x cross section | 2 X 4 X 1 $mm^2$ |

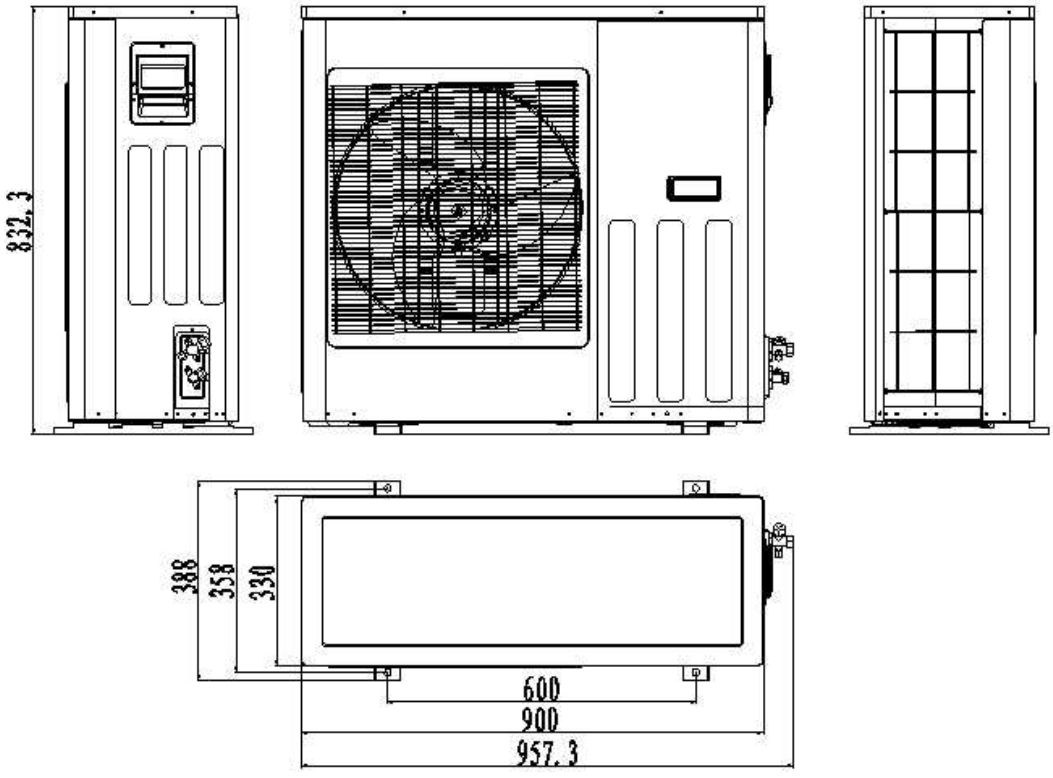
# 4. OUTLINE DIMENSION OF OUTDOOR AND INDOOR

## 4.1 Outline dimension of outdoor Units

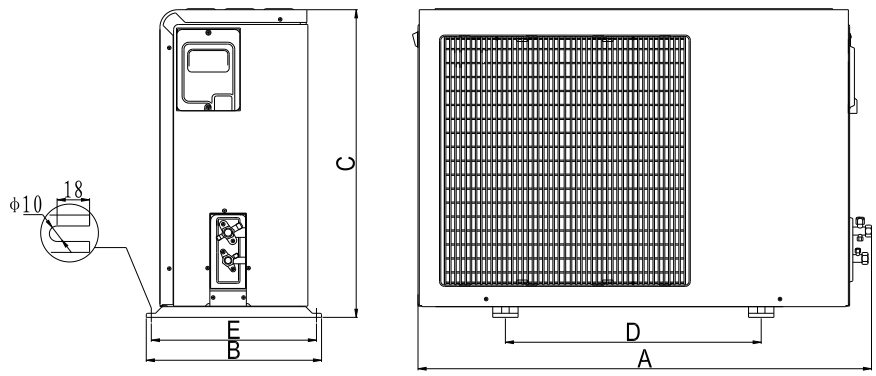
### CMV-50V9A-S




### CMV-V64T9AD

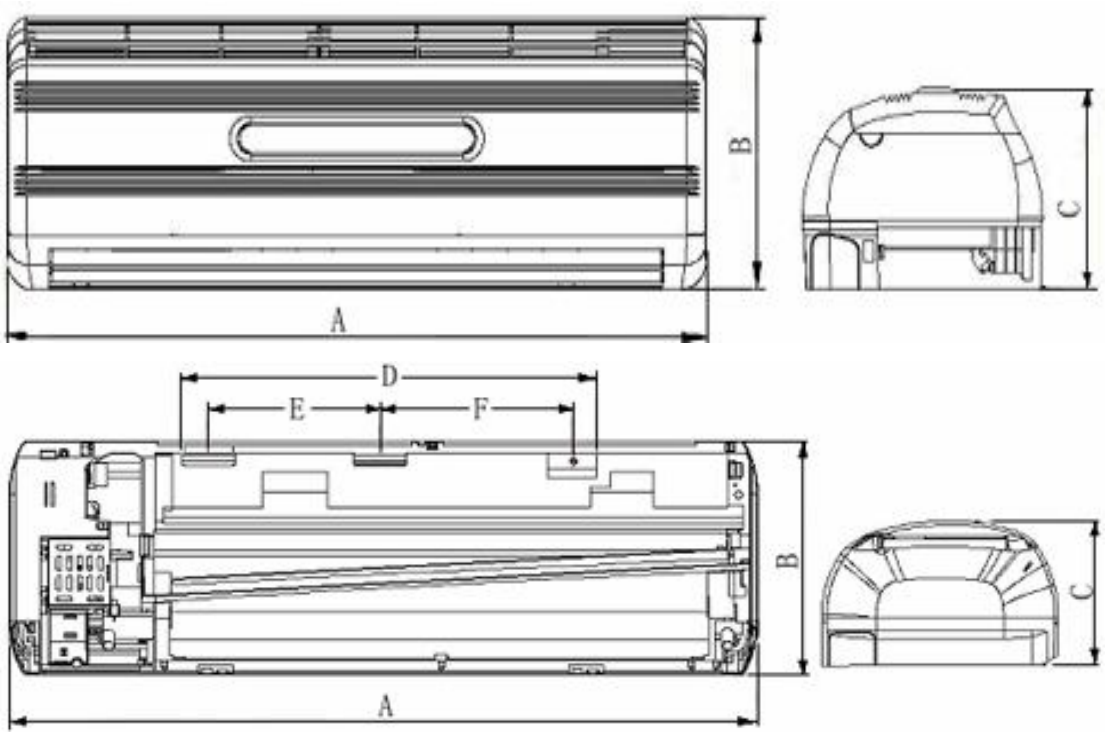


## 4.2 The outdoor unit mounting dimensions .




| Dimension's / Code / outdoor unit's type | the body's dimension | | | mounting dimensions | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| CMV-50V9A-S | 930 | 362 | 700 | 590 | 334 |
| CMV-V64T9AD | 958 | 388 | 835 | 600 | 358 |

## 4.3. The indoor unit mounting dimensions

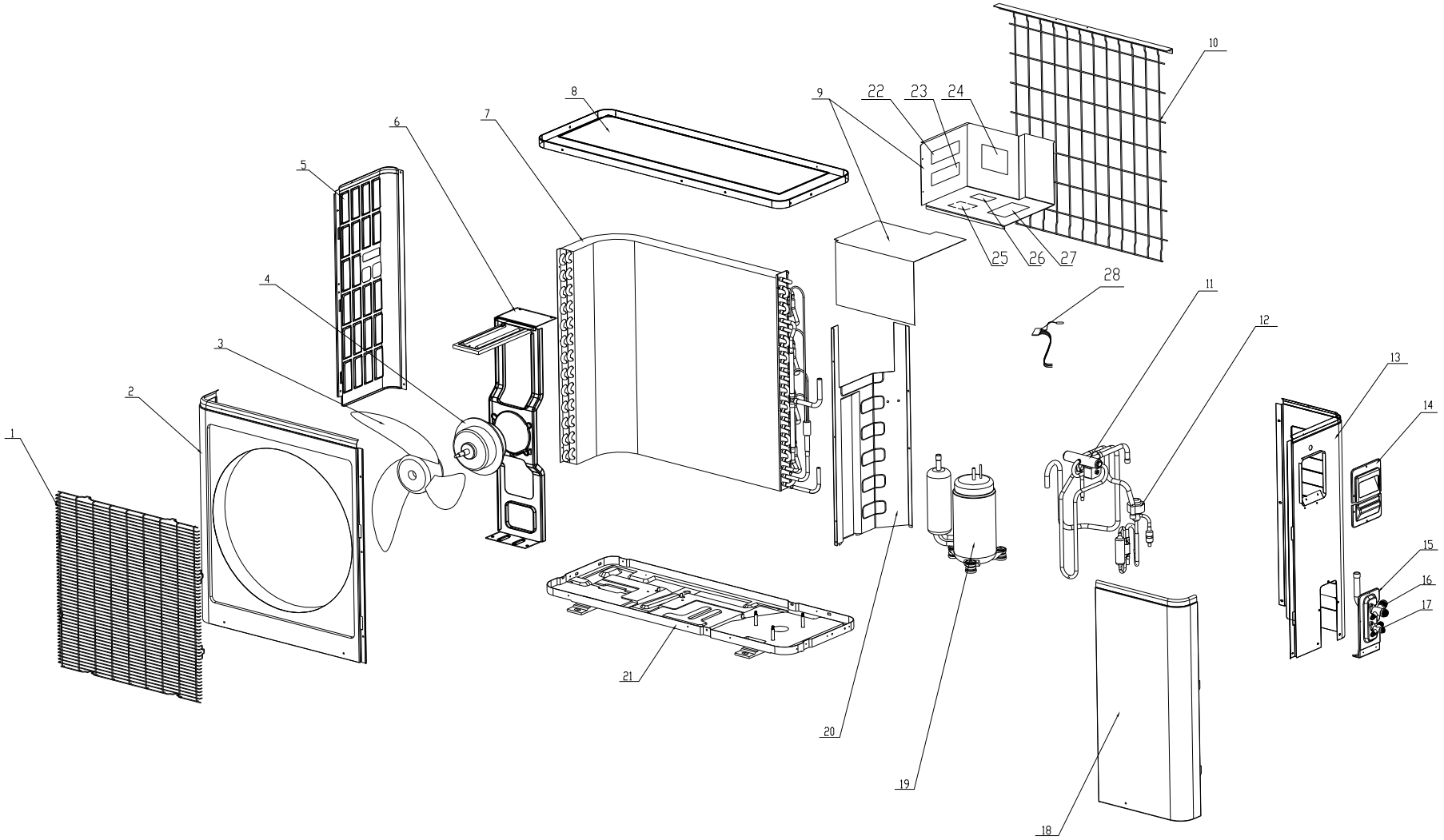



the unit： mm

| Dimension's Code / Indoor unit's type | the body's dimension | | | mounting dimensions | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| CMV-V25G9A-A | 790 | 270 | 180 | 490 | / | / |
| CMV-V32G9A-H | 940 | 270 | 180 | 490 | / | / |

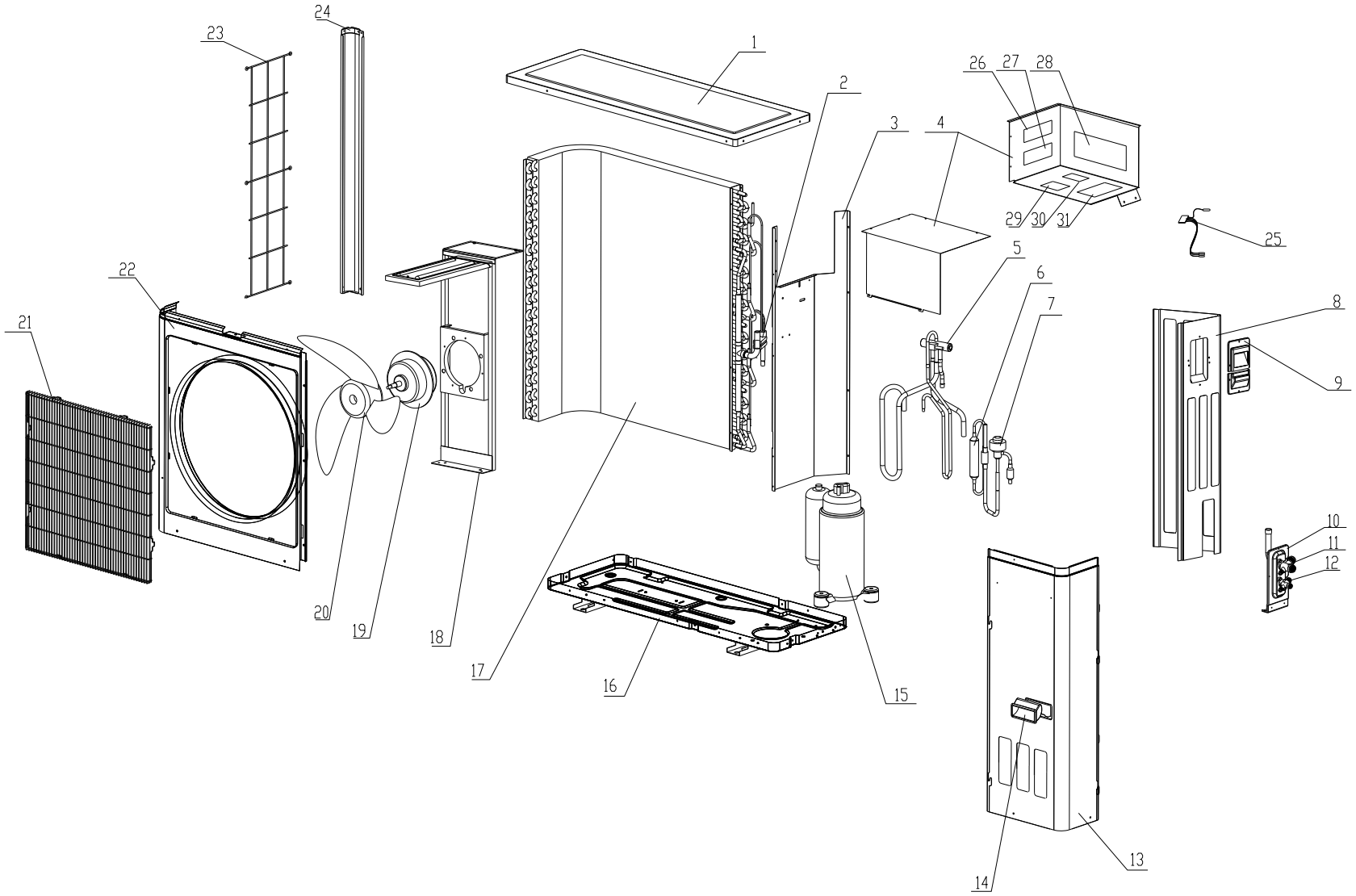
## 5、The outdoor unit structure exploded view .

### 5.1、The structure exploded view for CMV-50V9A-S



| 序号 (Serial Number) | 名称 (Part Name) | | 数量 (Quantity) |
|---|---|---|---|
| 28 | 传感器 | temperature sensor | 1 |
| 27 | 滤波板 | filter board | 1 |
| 26 | 滤波器 | filter | 1 |
| 25 | PFC电感 | PFC reactor | 1 |
| 24 | 主板 | CPU mainboard | 1 |
| 23 | 模块板 | IPM board | 1 |
| 22 | PFC板 | PFC board | 1 |
| 21 | 底盘 | Base | 1 |
| 20 | 中隔板 | Partition board | 1 |
| 19 | 压缩机 | Compressor | 1 |
| 18 | 维修板 | Maintenance plate | 1 |
| 17 | 高压阀 | Low-pressure valve | 1 |
| 16 | 低压阀 | High-pressure valve | 1 |
| 15 | 阀座板 | Valve installation plate | 1 |
| 14 | 电器盒盖 | Top of the Electric Box | 1 |
| 13 | 右侧板 | Right panel | 1 |
| 12 | 电子膨胀阀 | Electronic expansion valve | 1 |
| 11 | 四通阀组件 | Four-way valve assembly | 1 |
| 10 | 背网 | Rear Grill | 1 |
| 9 | 电器盒 | Electric box | 1 |
| 8 | 顶盖板 | Top panel | 1 |
| 7 | 冷凝器 | Condenser | 1 |
| 6 | 电机支架 | Motor support | 1 |
| 5 | 左侧板 | Left panel | 1 |
| 4 | 电　机 | Motor | 1 |
| 3 | 轴流风轮 | Axial flow fan | 1 |
| 2 | 面　板 | Front Plate | 1 |
| 1 | 前网罩 | Front Grill | 1 |

## 5.2 、The structure exploded view for CMV-V64T9AD .

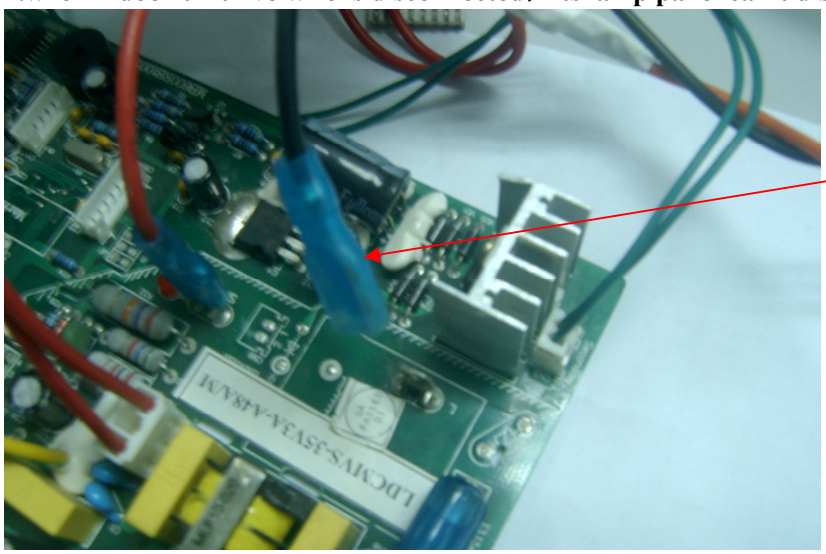


| | | | |
|---|---|---|---|
| 31 | 滤波板 | filter board | 1 |
| 30 | 滤波器 | filter | 1 |
| 29 | PFC电感 | PFC reactor | 1 |
| 28 | 主板 | CPU mainboard | 1 |
| 27 | 模块板 | IPM board | 1 |
| 26 | PFC板 | PFC board | 1 |
| 25 | 传感器 | temperature sensor | 1 |
| 24 | 左侧板 | Left panel | 1 |
| 23 | 左护网 | Left protect net | 1 |
| 22 | 前面板 | Front Plate | 1 |
| 21 | 前网罩 | Front Grill | 1 |
| 20 | 轴流风机 | Axial flow fan | 1 |
| 19 | 电机 | Motor | 1 |
| 18 | 电机支架 | Motor support | 1 |
| 17 | 冷凝器 | Condenser | 1 |
| 16 | 底盘 | Base | 1 |
| 15 | 压缩机 | Compressor | 1 |
| 14 | 小抽手 | Small handle | 2 |
| 13 | 维修板 | Maintenance plate | 1 |
| 12 | 高压阀 | High-pressure valve | 1 |
| 11 | 低压阀 | Low-pressure valve | 1 |
| 10 | 阀座板 | Valve installation plate | 1 |
| 9 | 电器盒盖 | Top of the Electric box | 1 |
| 8 | 右侧板 | Right panel | 1 |
| 7 | 电子膨胀阀 | Electronic expansion valve | 1 |
| 6 | 干燥过滤器 | Desiccation filter | 1 |
| 5 | 四通阀 | Four-way valve | 1 |
| 4 | 电控盒 | Electric box | 1 |
| 3 | 中隔板 | Partition board | 1 |
| 2 | 减振块 | Anti-vibration pad | 1 |
| 1 | 顶盖板 | Top panel | 1 |
| 序号 (Serial Number) | 名称 (Part Name) | | 数量 (Quantity) |

## 6、The analysis of indoor malfunction code（internal wiring get loose, which will cause malfunction.）

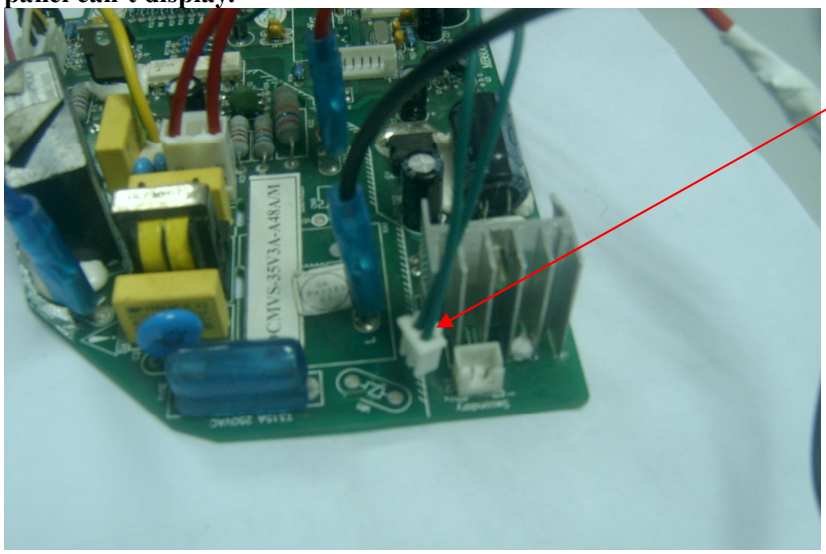
### Ⅰ、indoor detailed malfunction

**1.when indoor unit live wire is disconnected，its lamp panel can't display.**

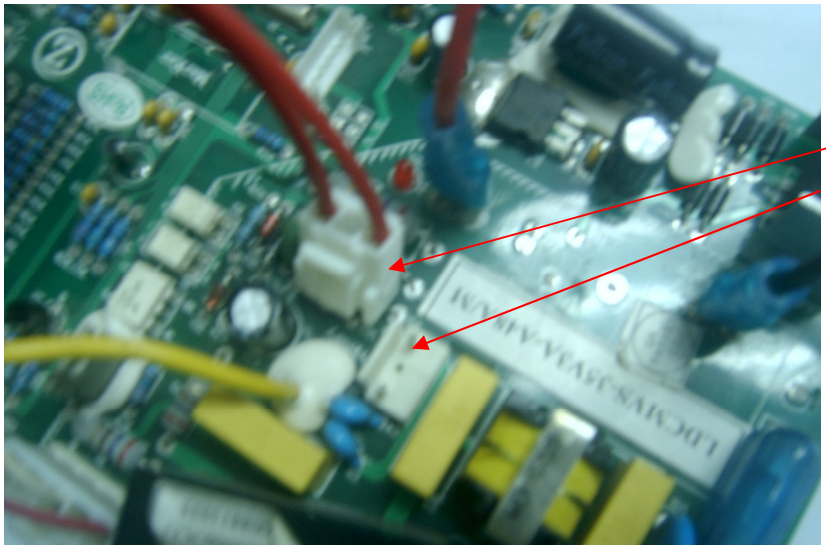


Live wire is off。

**2.when the transformer's secondary and primary disconnect or indoor fuse is off，the indoor unit lamp panel can't display.**

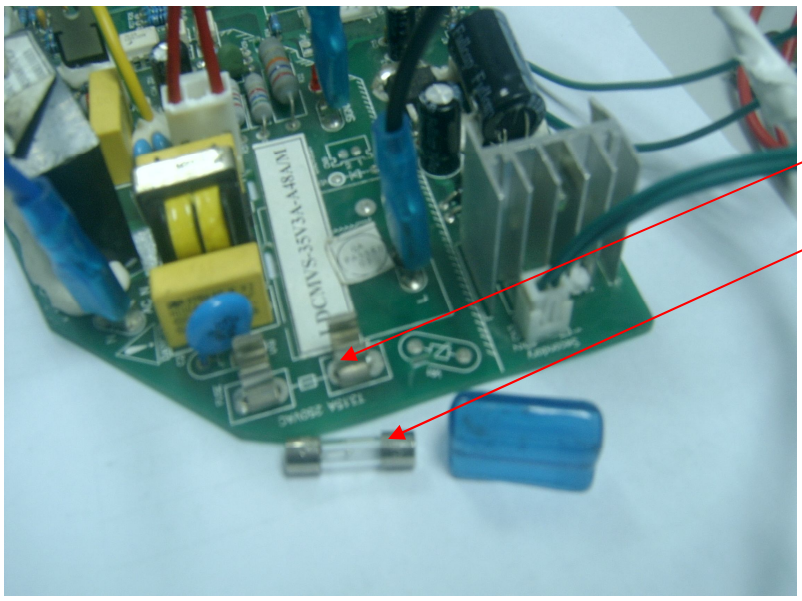


Transformer secondary is off



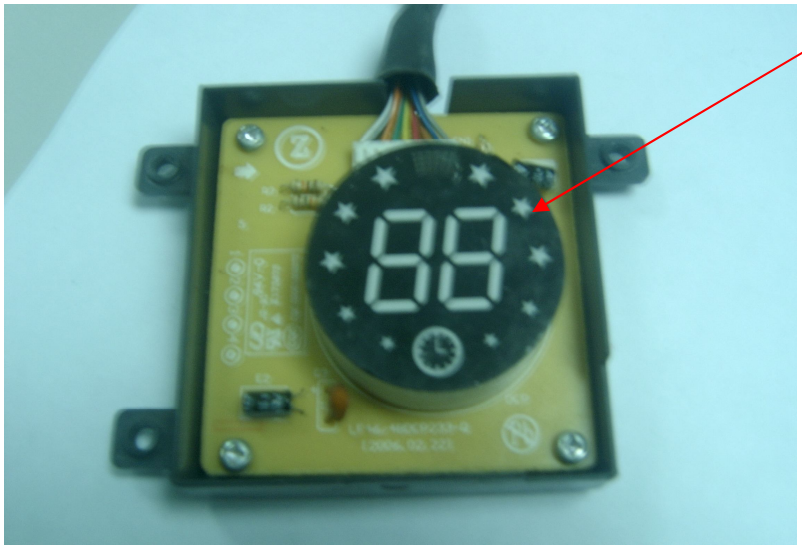
Transformer primary is off

The relevant transfomer primary socket



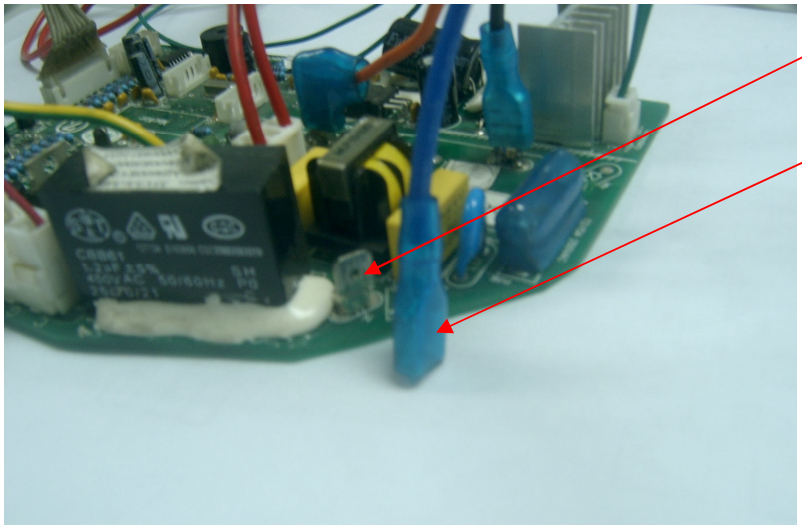
Indoor unit fuse is off.

The indoor unit fuse



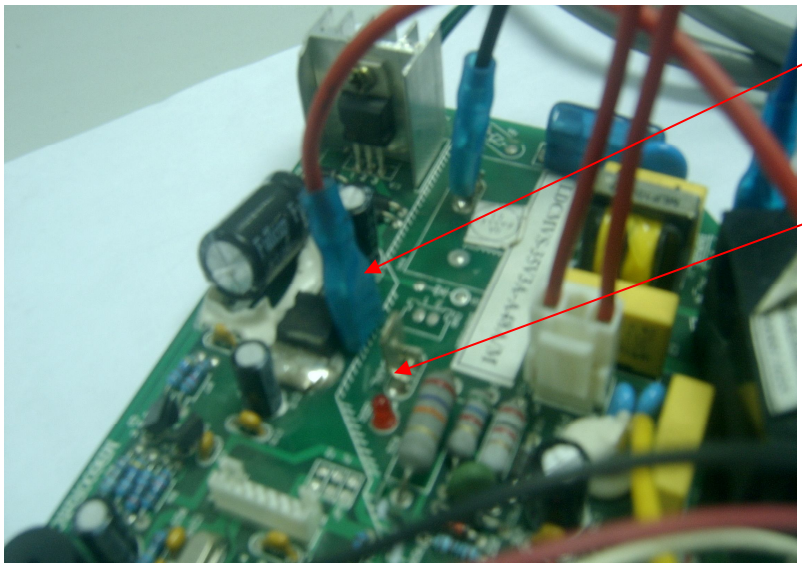
The condition that the lamp panel can't display。

**3.（1）when the indoor null line is off，the system displays F1 code 。**
**（2）when indoor communication wire is off，the system also displays F1 code 。**



The inserted slice to null line

The indoor unit null line is off。

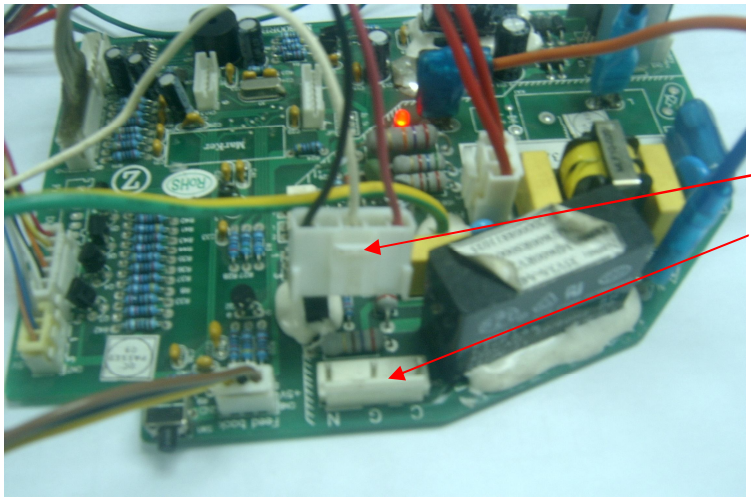


（2）the indoor communication wire is off.

Communication wire socket.

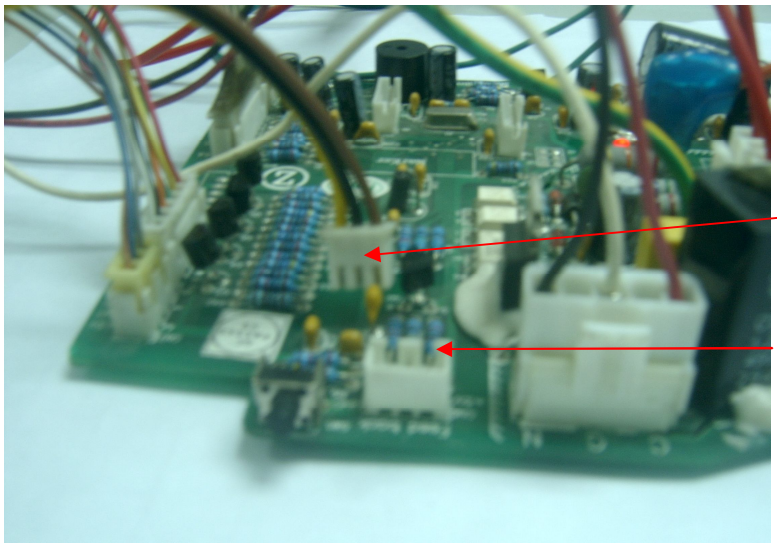
the indoor lamp panel displays F1 code.

**4. when indoor fan mainline or feedback wire is off，the indoor lamp panel displays F4 code. After directly insert it well， To restart the unit to recover normal .**



Indoor fan mainline is off。

The relevant socket with indoor fan mainline

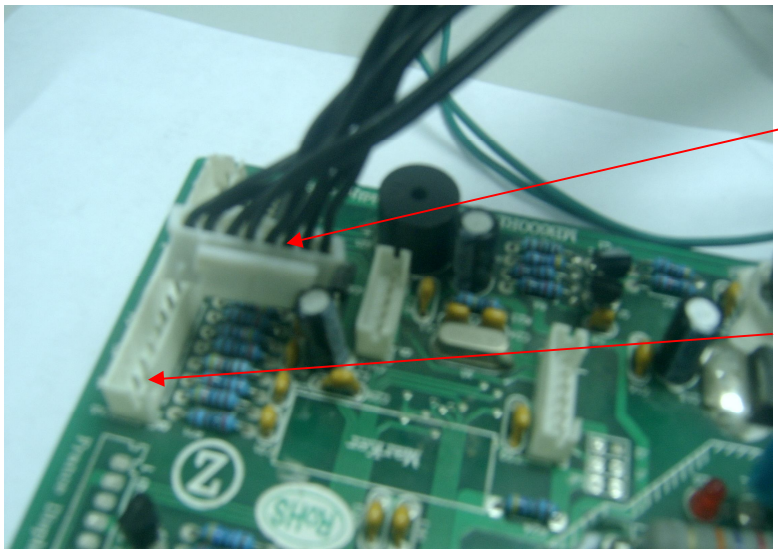


indoor fan feedback wire is off。

the relevant socket with indoor feedback wire 。

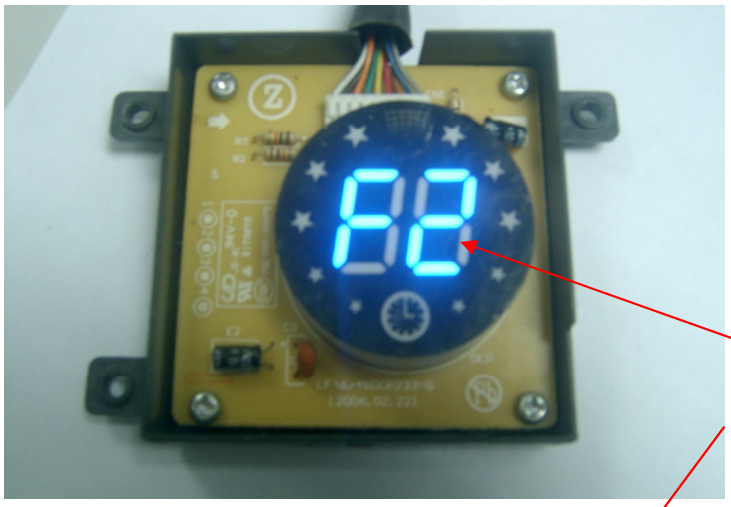
The lamp panel displays F4 code.

**5.when indoor sensor has the problem, the lamp will display $F_2$ 、 $F_3$ code. When indoor coil outlet , inlet and middle temperature sensor appear malfunction, the lamp panel displays F3 code; when indoor temperature sensor appears fault, the lamp panel shows F2 fault code.**



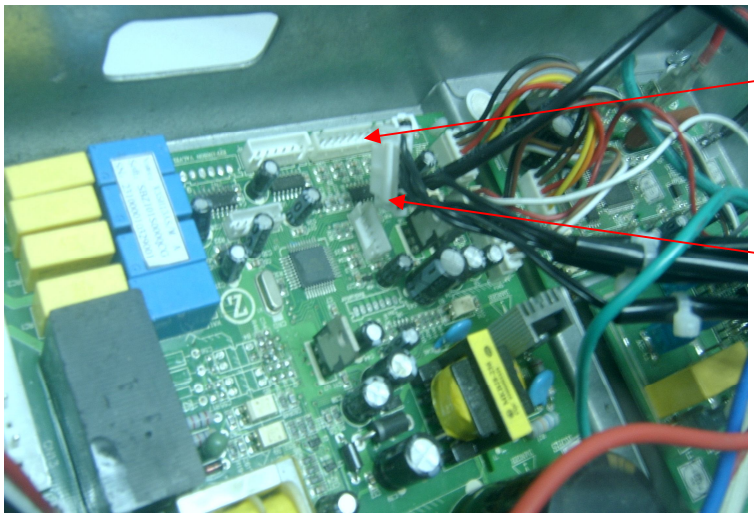
Indoor temperature sensor plug

the relevant socket of indoor temperature sensor plug



The lamp panel alternately displays F2,F3 fault code.

**6.when outdoor temperature sensor is off or loose contact，the indoor lamp panel displays F6 fault code.**

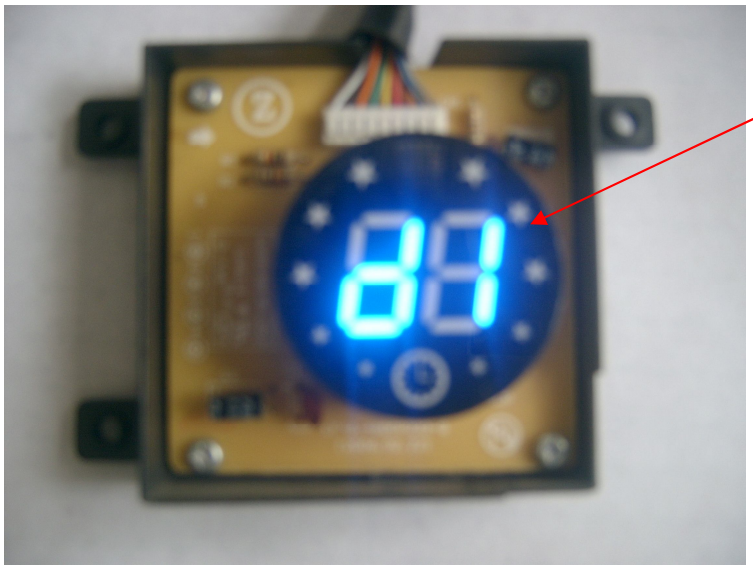


the relevant socket of outdoor temp. sensor.

The outdoor temperature sensor is off or loose contact.

The indoor lamp panel displays F6 fault code.

**7.when the system appears mode conflict， the indoor lamp panel shows d1 code.**



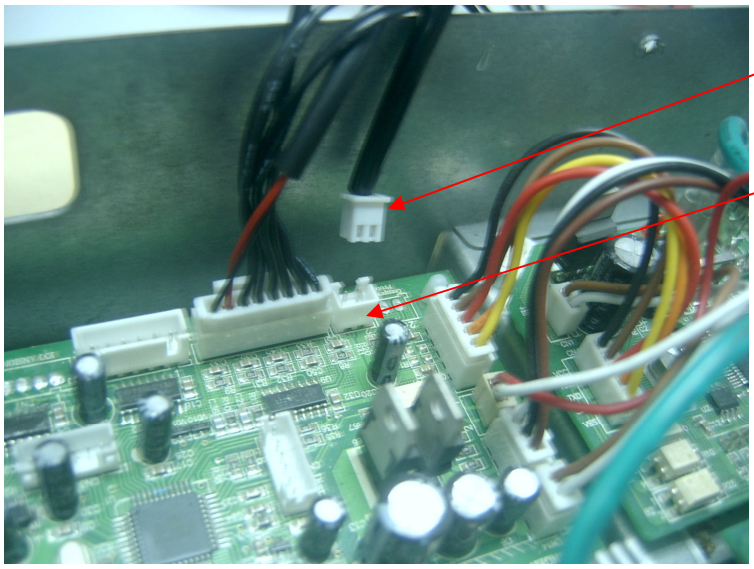
the indoor lamp panel shows **d1** code.

**8.when the system is in the defrosting condition， The lamp panel displays dF code.**

The lamp panel displays **dF** code.

**Ⅱ． The outdoor electrical control fault code of the America 12K model .**

**1.the outdoor module temperature sensor is off or loose contact， the lamp panel shows F6 code.**

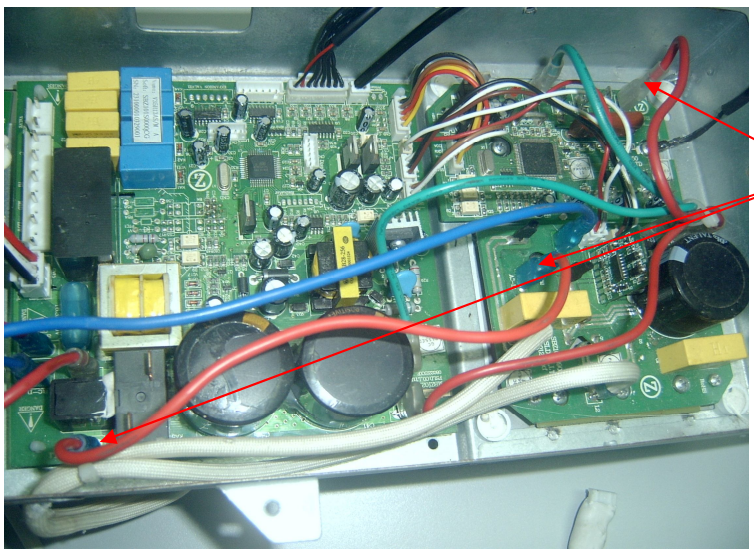


the outdoor module temperature sensor is off or loose contact .

the relevant socket with the outdoor module temperature sensor plug .

The lamp panel shows F6 code .

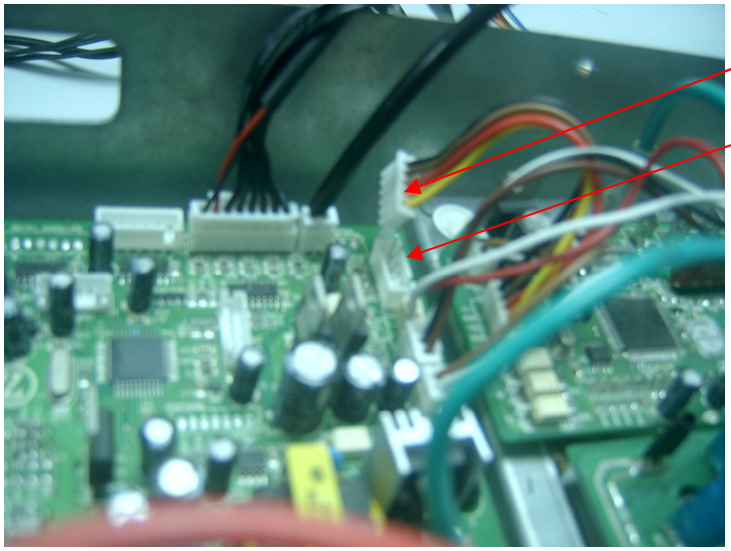
**2.The outdoor unit DC busbar voltage is abnormal，the lamp panel shows F7code.**



The P、N power wire are off .

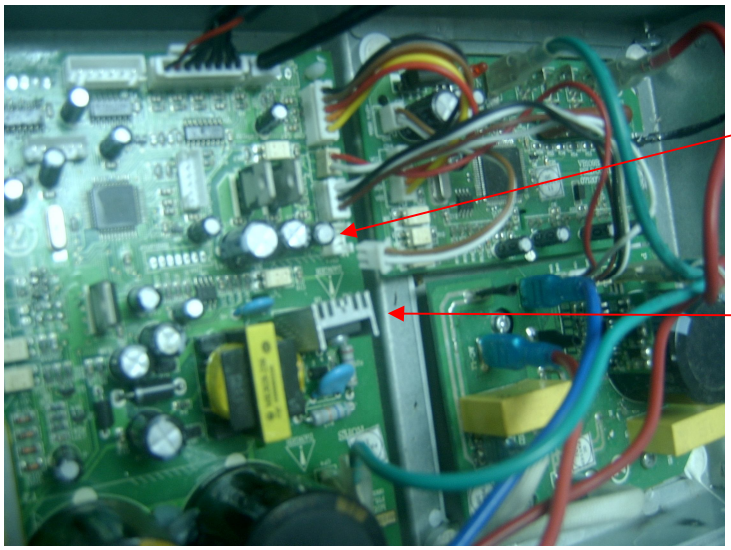
The lamp panel shows F7code.

**3.the outdoor module drive wire is off ， the lamp panel shows FC code .**



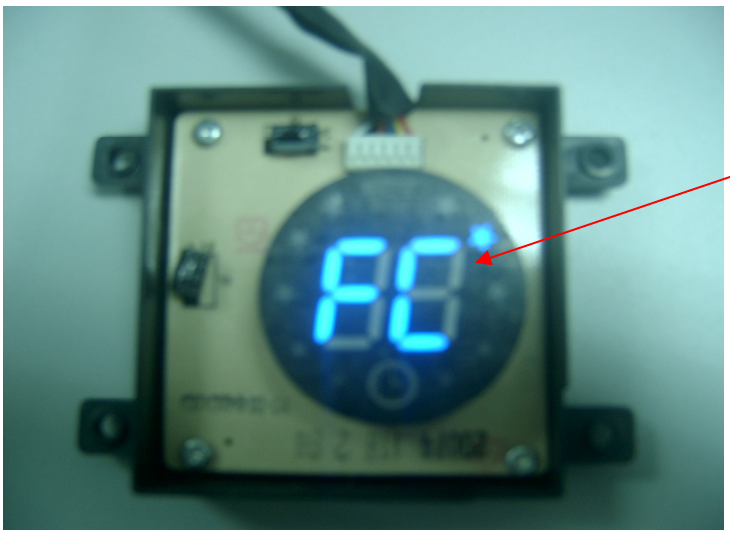
The outdoor module drive wire is off .

The matching socket with the outdoor module drive wire



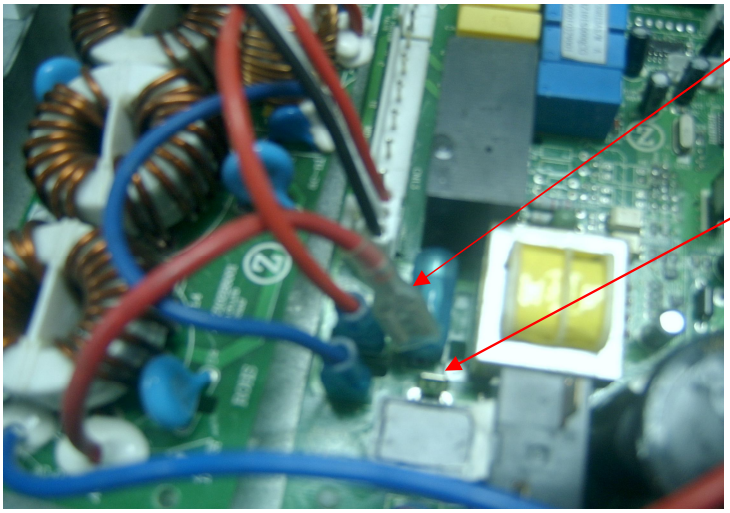
The matching socket with the outdoor module drive wire .

The outdoor module drive wire is off .




The lamp panel shows FC code .

**4、the wave filtering board and mainboard power wire is off or loose contact，the lamp panel shoes F1 code .**

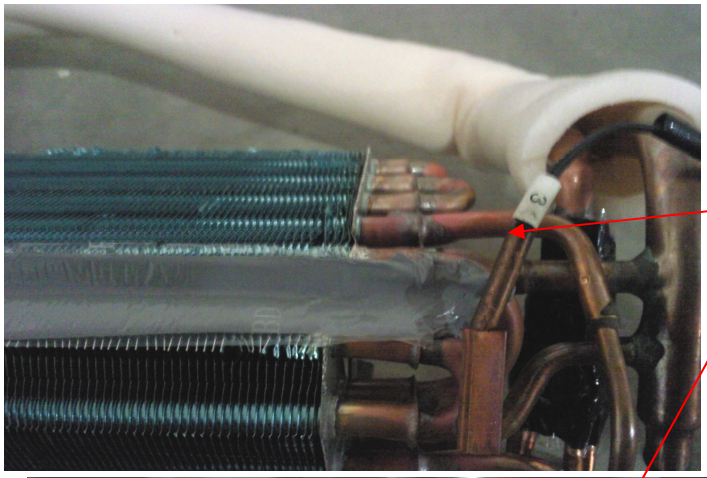


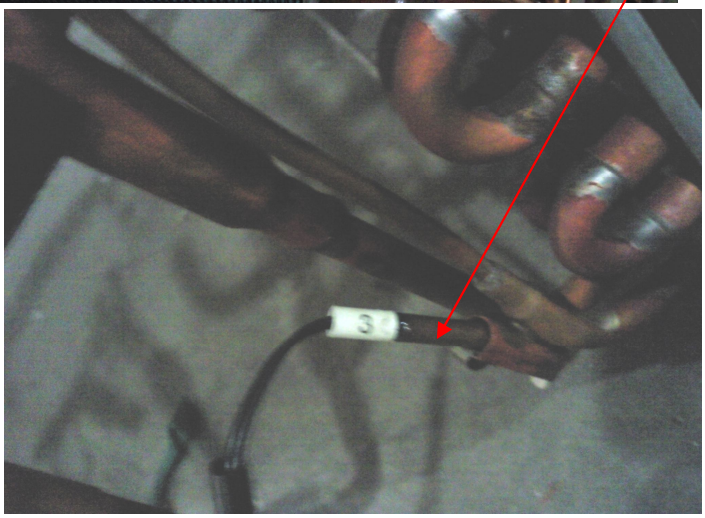
the wave filtering board and mainboard power wire is off or loose contact

The matching socket with the wave filtering board and mainboard power wire

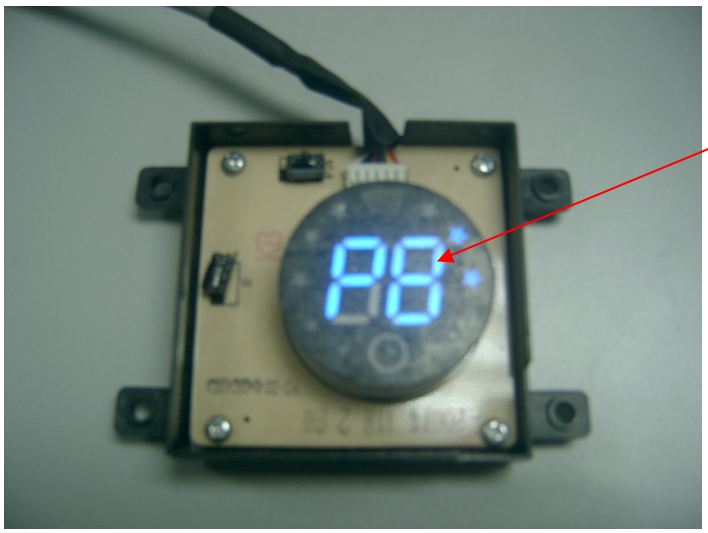
the lamp panel shoes F1 code .

**5. the evaporator middle temperature and condenser middle temperature sensor is off ， the lamp panel displays P8 code .**



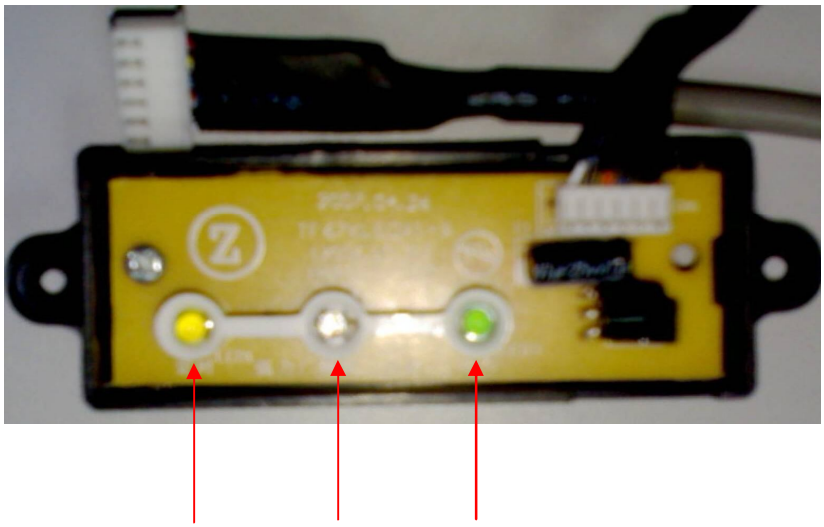


the evaporator middle temperature and condenser middle temperature sensor is off




the lamp panel displays P8 code

**The 67th style indoor lamp panel**



**The timing lamp  The turbo lamp  The running lamp**

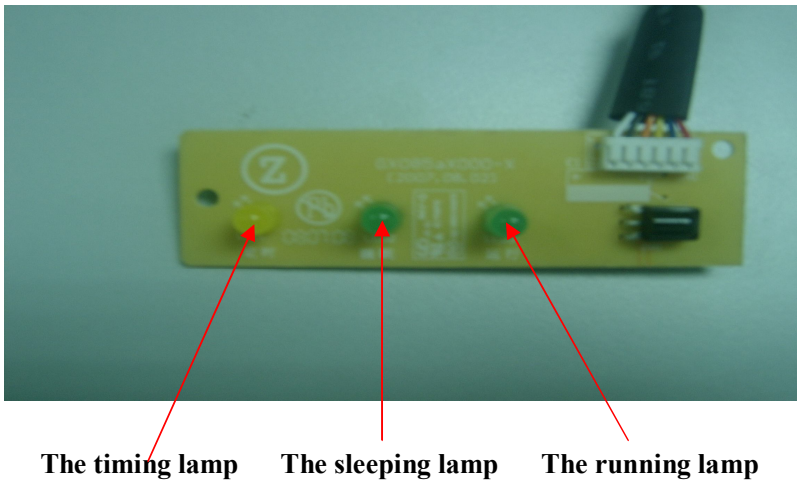
**The indoor unit faulty display:**

| Faulty contents | Trouble display |
|---|---|
| Communication fault | The running lamp lightens all the time, the turbo lamp lightens 2 times , and then extinguish 2 seconds。 |
| Indoor fan fault | The running lamp lightens all the time, the turbo lamp lightens 5 times, and then extinguish 2 seconds。 |
| Indoor temp. sensor fault | The running lamp lightens all the time, the turbo lamp lightens 3 times , and then extinguish 2 seconds。 |
| Indoor coil outlet temp. sensor fault | The running lamp lightens all the time, the turbo lamp lightens 4 times, and then extinguish 2 seconds。 |
| Indoor coil inlet temp. sensor fault | The running lamp lightens all the time, the turbo lamp lightens 4 times , and then extinguish 2 seconds。 |
| Indoor coil middle temp. sensor fault | The running lamp lightens all the time, the turbo lamp lightens 4 times , and then extinguish 2 seconds。 |
| Mode conflict | The running lamp lightens 1 time , and then extinguish 1 second。 |
| Defrosting or anti cold air | The timing lamp lightens 1 time , and then extinguish 1 second。 |

**The outdoor unit faulty display:**

| Faulty contents | Trouble display |
|---|---|
| the outdoor unit transducer module protection faulty | The timing lamp lightens all the time, the turbo lamp lightens 2 times , and then extinguish 2 seconds。 |
| over current of outdoor unit | The timing lamp lightens all the time, the turbo lamp lightens 3 times , and then extinguish 2 seconds。 |
| discharge temp. of compressor too high, outside ambient temp. too high, switch temp. of compressor crust cut off, temp. of module too high | The timing lamp lightens all the time, the turbo lamp lightens 4 times , and then extinguish 2 seconds。 |
| The outdoor unit DC busbar voltage is abnormal | The timing lamp lightens all the time, the turbo lamp lightens 7 times , and then extinguish 2 seconds。 |
| lack refrigerant or reverse valve fault | The timing lamp lightens all the time, the turbo lamp lightens 8 times , and then extinguish 2 seconds。 |
| outdoor sensor fault | The running lamp lightens all the time, the turbo lamp lightens 7 times , and then extinguish 2 seconds。 |
| outdoor unit drive fault, start compressor failure | The running lamp lightens all the time, the turbo lamp lightens 6 times , and then extinguish 2 seconds。 |

**The 85th style indoor lamp panel**




| Faulty contents | Trouble display |
|---|---|
| Communication fault | The timing lamp lightens all the time, the sleeping lamp lightens 2 times , and then extinguish 2 seconds。 |
| Indoor fan fault | The timing lamp lightens all the time, the sleeping lamp lightens 5 times , and then extinguish 2 seconds。 |
| Indoor temp. sensor fault | The timing lamp lightens all the time, the sleeping lamp lightens 3 times , and then extinguish 2 seconds。 |
| Indoor coil outlet temp. sensor fault | The timing lamp lightens all the time, the sleeping lamp lightens 4 times , and then extinguish 2 seconds。 |
| Indoor coil inlet temp. sensor fault | The timing lamp lightens all the time, the sleeping lamp lightens 4 times , and then extinguish 2 seconds。 |
| Indoor coil middle temp. sensor fault | The timing lamp lightens all the time, the sleeping lamp lightens 4 times , and then extinguish 2 seconds。 |
| Mode conflict | The timing lamp lightens 1 time , and then extinguish 1 second。 |
| Defrosting or anti cold air | The running lamp lightens 1 time , and then extinguish 1 second。 |

| Faulty contents | Trouble display |
|---|---|
| the outdoor unit transducer module protection faulty | The running lamp lightens all the time, the sleeping lamp lightens 2 times , and then extinguish 2 seconds。 |
| over current of outdoor unit | The running lamp lightens all the time, the sleeping lamp lightens 3 times , and then extinguish 2 seconds。 |
| discharge temp. of compressor too high, outside ambient temp. too high, switch temp. of compressor crust cut off, temp. of module too high | The running lamp lightens all the time, the sleeping lamp lightens 4 times , and then extinguish 2 seconds。 |
| The outdoor unit DC busbar voltage is abnormal | The running lamp lightens all the time, the sleeping lamp lightens 7 times , and then extinguish 2 seconds。 |
| lack refrigerant or reverse valve fault | The running lamp lightens all the time, the sleeping lamp lightens 8 times , and then extinguish 2 seconds。 |
| outdoor sensor fault | The timing lamp lightens all the time, the sleeping lamp lightens 7 times , and then extinguish 2 seconds。 |
| outdoor unit drive fault, start compressor failure | The timing lamp lightens all the time, the sleeping lamp lightens 6 times , and then extinguish 2 seconds |

## 6.3 The malfunction oindoor and outdoor unit

### （1）The common malfunction code analysis and solutions!

| The fault code | The fault content | The reason of fault and its solutions |
|---|---|---|
| F1 | The communication fault | 1、The communication wire is broken off. Please check whether the wire is disentwined ;<br>2、Please check whether the electrical control board is damaged. It should be replaced when it is damaged;<br>3、Please check whether the power ground wire is reliable;<br>4、Please check whether the unit is abnormal caused by the external interference. If it is, then find the interfering sources, and remove them. |
| F2 | The indoor temperature sensor fault | 1、Check whether the resistance of sensor is normal, otherwise replace it;<br>2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above;<br>3、When the 1 and 2 are both normal, then the component or integrated circuit is damaged, the electric control board should be replaced. |
| F3 | The indoor coil temperature sensor fault | 1、Check whether the resistance of sensor is normal, otherwise replace it;<br>2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board ,repair it if there is any above;<br>3、When the 1 and 2 are both normal, then the component or integrated circuit is damaged, the electric control board should be replaced. |
| F4 | Indoor PG motor fault (tap motor hasn't so breakdown ) | 1、Check whether the contact of the plug of the motor wire and socket is well. Please make sure it is well contacted;<br>2、Check whether the indoor motor has damaged, the motor should be replaced when it is damaged;<br>3、Check whether the controllable silicon and other components on the electric control board have damaged，replace the controllable silicon or electric control board when they are damaged;<br>4、Check whether the indoor fan is unobstructed when running, please fix the indoor fan again when it is obstructed. |
| F5 | IPM protection | 1、Check whether the supply voltage is out of ranging from 150 to 270V(overvoltage and undervoltage protection);<br>Measuring the actual current, if the current is greater than the rated current of 2A,it is over-temperature protection;<br>If the above are normal, that is IPM module internal circuit fault protection, so please replace the IPM module. |
| F6 | The outdoor sensor fault | 1、Check whether the resistance of sensor is normal, otherwise replace it;<br>2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above;<br>3、When the 1 and 2 are both normal ,then the component or integrated circuit is damaged, the electric control board should be replaced. |
| F7 | The outdoor coil | 1、Check whether the resistance of sensor is normal, |

| | | |
|---|---|---|
| | temperature sensor fault（Including the mid-point of tube、inspiratory gas） | otherwise replace it;<br>2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above;<br>3、When the 1 and 2 are both normal, then the component or integrated circuit is damaged, the electric control board should be replaced. |
| F9 | Exhaust gas sensor failure | 1、Check whether the resistance of sensor is normal, otherwise replace it;<br>2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above;<br>3、When the 1 and 2 are both normal, then the component or integrated circuit is damaged, the electric control board should be replaced. |
| FA | The communication fault between the wire controller and the indoor PCB | 1、 check whether the wire controller's connecting wire is short circuit or loose, please make it connect well;<br>2、 Check the connecting line、wire controller、PCB whether they are loose or have a bad contact. Please make them have a good contact. |
| FC | outdoor unit driving fault, starting compressor failure | 1、Turn on the power again, and then check whether the operation of the compressor is normal;<br>2、Check whether the connection of the compressor is correct or reliable, otherwise repair it;<br>3、Check whether the components on the electric control board have been damaged, if they are damaged, the components or the electric control board should be replaced.;<br>4、Check whether the connecting wires are disentwined between the Intelligent Power Module board and the main board, otherwise make the wires connect firmly . |
| FF | The outdoor DC motor fault | 1、Check the resistance value of the DC motor port. If it is short circuit, please change the DC motor;<br>2、Check the voltage value of the DC motor port VCC(15Vdc)、Vdm(340Vdc),please change the PCB board if the voltage values are abnormal;<br>3、if all the voltage values of the DC motor port are normal，the Vsp voltage（0~5v）is also ok ,it shows that the inner PCB board of the DC motor is damaged, then change the DC motor. |
| FH | The indoor unit EEPROM error | 1、Check whether there are false weld and bad contact etc between the EEPROM chip block and the electronic control board ;<br>2、Check whether the EEPROM chip pin is broken foot and the direction of installation is in line with the EEPROM block;<br>3、When the procedure of EEPROM chip and itself have fault it will appear the code FH. That is the need to replace the EEPROM chip. |
| dF | Defrosting state | The unit is in defrosting state，that is normal. |
| dI | Mode conflict | When the running mode for No.1 indoor unit is different from No.2 indoor unit, the dF is displayed. |

| The fault code | The fault content | The reason of fault and solution |
|---|---|---|
| P1 | Indoor coil temperature over-temperature protection for heating (thermal overload), outdoor coil temperature overheating protection for cooling (cooling overload) | 1、 Check whether the ambient temperature is over the range of air-conditioning running temperature ;<br>2、 Check whether the indoor coil temperature is higher than or equal to 63 degrees when heating and check whether the outdoor coil temperature is higher than or equal to 65 degrees when cooling, it will appear protection if the value is over the above;<br>3、 Check whether the parameters of indoor and outdoor coil temperature sensors are normal, if abnormal, please replace the sensors;<br>4、 If the above are normal, check whether the main control board output parameters are normal, if abnormal, please replace the main control board. |
| P2 | The outdoor unit inverter module protection fault | 1、Check whether the connection of the compressor is reliable, otherwise connect firmly again;<br>2、Check whether the fixation between the IPM module and the radiator is firm.;<br>3、Check whether the compressor is well, otherwise replace it;<br>4、Check whether the IPM module is abnormal, otherwise replace it. |
| P3 | Over current of outdoor unit | 1、Check whether the ambient temperature exceeds the operation range for the air conditioner;<br>2、Check whether the current detection circuit is abnormal, the electric control should be replaced when it is abnormal.. |
| P4 | discharge temperature of compressor is too high, the outside ambient temperature over-temperature, switch off the compressor shell temperature, module temperature over-temperature | 1、Check whether the pressure is normal when the unit is running, if it is abnormal, you should detect the leakage and then welding and adding refrigerant;<br>2、Check whether the ambient temperature is too high or too low, when the temperature is more than -20 degrees and less 55 degrees, it can disappear automatically;<br>3、Check whether temperature switch of compressor is damage, it should be replaced if it is damaged. |
| P7 | The outdoor unit DC generatrix voltage is abnormal | 1、Check whether the supply voltage is out of ranging from 150 to 270V;<br>2、Check the voltage detection circuit of the IPM base board is abnormal, if it is abnormal, the IPM base board or the electric control board should be replaced. |
| P8 | lack refrigerant or reverse valve fault | 1、Check whether the high and low pressure valves have been opened, otherwise open the valves;<br>2、Check whether the indoor coil pipe temperature sensor is normal, if it is abnormal, the sensor should be replaced;<br>3、Check whether the indoor coil temperature sensor hung in the air，please plug it in a correct position if the indoor coil temperature sensor hung in the air;<br>4、Check the system pressure is abnormal, if it is abnormal, yon should detect leakage and the welding and adding the refrigerant.;<br>5、Please change the outdoor PCB board , if all above are normal. |
| PA | protection when indoor pipe temperature is too low (Anti-icing) | 1、 Check whether the ambient temperature is over the range of air-conditioning running temperature;<br>2、 Check the indoor coil temperature is less than or equal to -1 degrees, if more than this value it will be the protection of;<br>3、 Check whether the indoor coil temperature sensor parameters are normal, if abnormal it is the replacement of the sensor;<br>4、 If the above are normal, check whether the main control |

| | | |
|---|---|---|
| | | board output parameters are normal, if abnormal ,please replace the main control board. |
| PC | Outdoor ambient temperature over-temperature protection (including high and low) | 1、Check whether the outdoor ambient temperature is too high or too low, when the ambient temperature is lower than (T> -20, T <55), this fault automatically discharges;<br>2、Check whether the outdoor temperature sensor's ring temperature parameters are normal, if abnormal ,please replace the sensor;<br>3、If the above are normal, check whether the main control board's output parameters are normal, f abnormal ,please replace the main control board. |
| PE | EEPROM reading error (outdoor unit) | 1、Check whether there are false weld and bad contact etc between the EEPROM chip block and the electronic control board ;<br>2、Check whether the EEPROM chip pin is broken foot and the direction of installation is in line with the EEPROM block;<br>3、When the procedure of EEPROM chip and itself have fault it will appear the code PE. At this time there is the need to replace the EEPROM chip. |

# 7、DC inverter multi-split series faulty code manual

**DC inverter multi-split series faulty code manu**

**Malfunction code：F1 （the communication faulty）**

*The faulty cause：*
*1、the communication wire is broken off or connected wrongiy；、*
*2、the power ground wire is connected unfirmly；、*
*3、the indoor PCB's hardware has been damaged；*

Turn off the power

Whether the communication wire is connected wrongly or disentwined.

Y

1、 Refer to the connecting diagram (Fig. 1), check whether the wire is connected correctly.
2、 Pls screw again to make the wire firm.

N

The indoor PCB fault，check whether the communication circuit on the indoor PCB has been damaged，check especially some important electric parts，such as the optical coupler、voltage stabilizing diode、resistor、

Y

If the indoor PCB has been damaged, pls change it.

N

The outdoor PCB fault，check whether the communication circuit on the outdoor PCB has been damaged，check especially some important electric parts，such as the optical coupler、voltage stabilizing diode、resistor、PTC，and so on ； Pls replace the PCB if being abnormal (Fig. 3).

**Note：** there are two kinds of connecting technics for the indoor and outdoor connecting cable，Fig 2 shoed the technics before 2007，and Fig 3 showed the technics after 2007

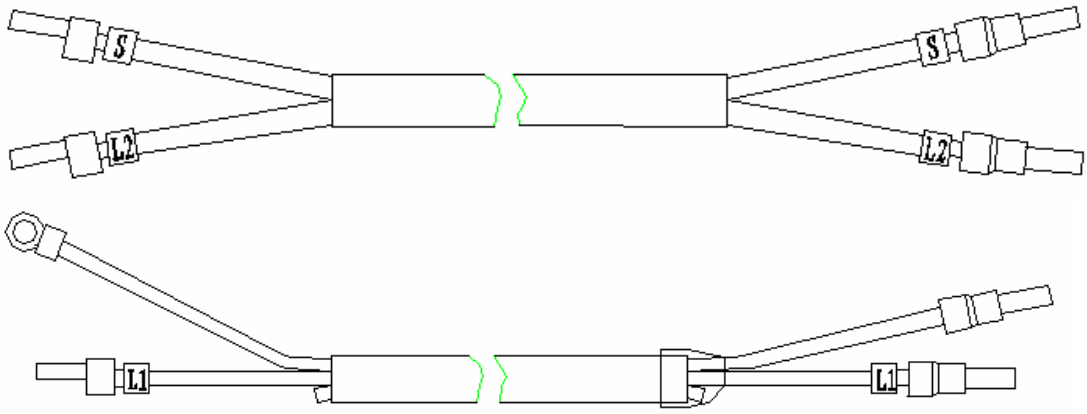



**Fig. 2** the indoor and outdoor connecting cable's technics before 2007

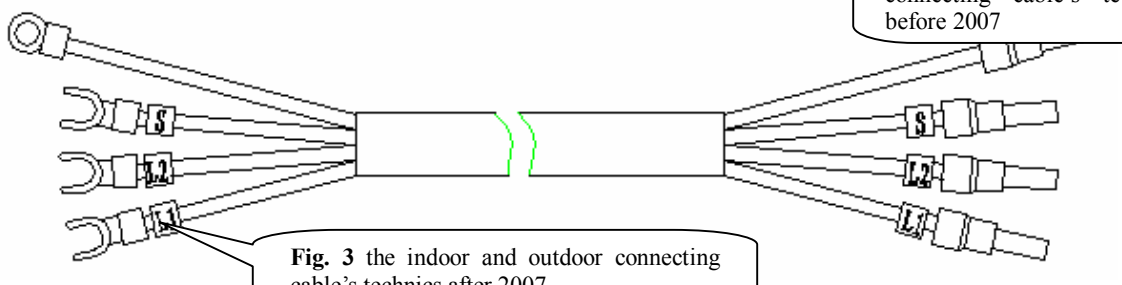



**Fig. 3** the indoor and outdoor connecting cable's technics after 2007

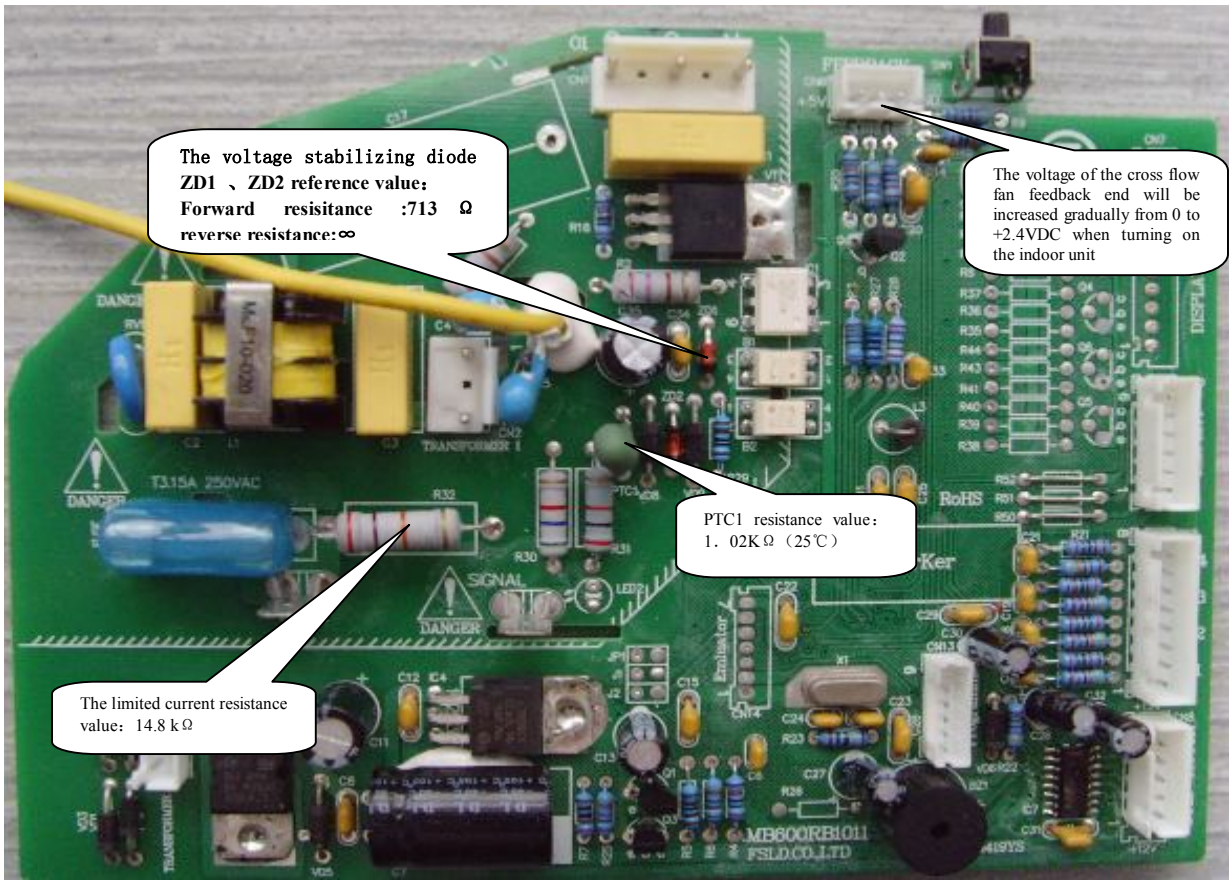

The voltage stabilizing diode ZD1 、ZD2 reference value：
Forward resisitance :713 Ω
reverse resistance:∞
The voltage of the cross flow fan feedback end will be increased gradually from 0 to +2.4VDC when turning on the indoor unit
PTC1 resistance value：
1．02KΩ（25℃）
The limited current resistance value：14.8 kΩ
T315A 250VAC
SIGNAL
DANGER
MB600RB1011
FSLD.CO.,LTD

**Fig. 4: the indoor PCB** Note：the above parameter is tested when there is the power in the PCB, so is the following 。

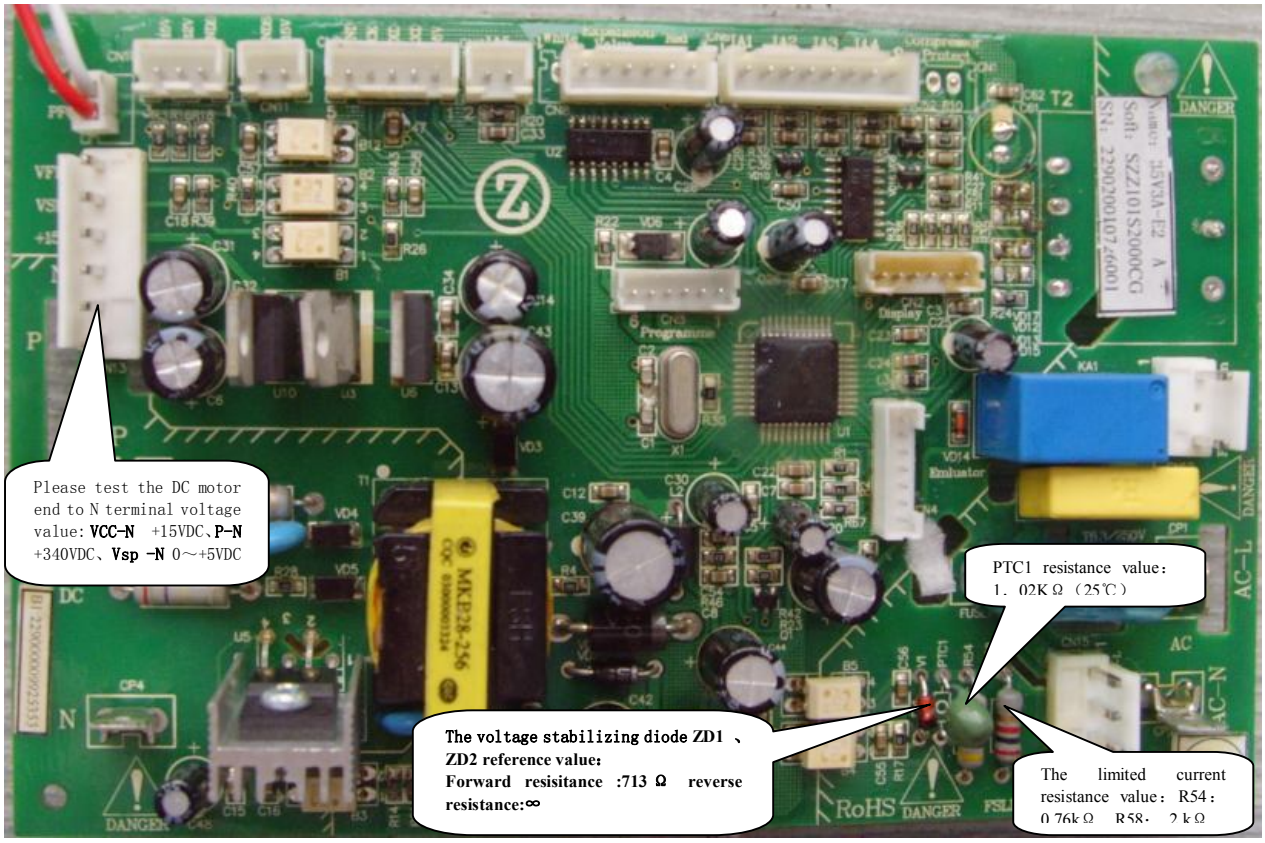
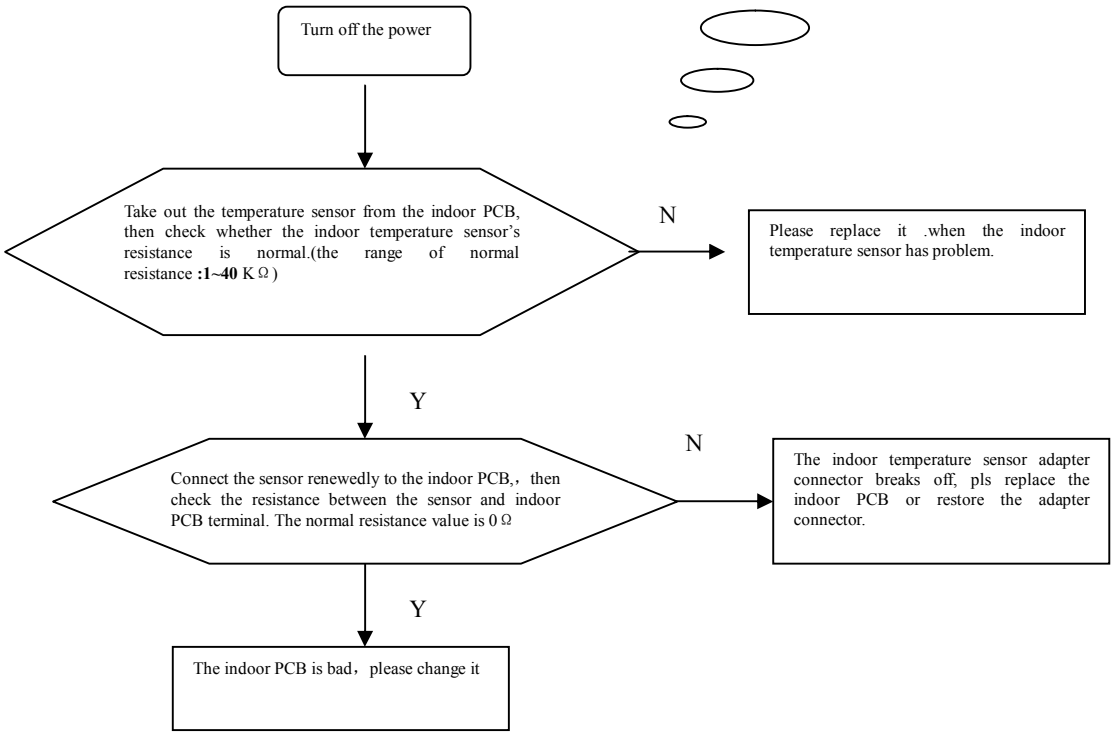


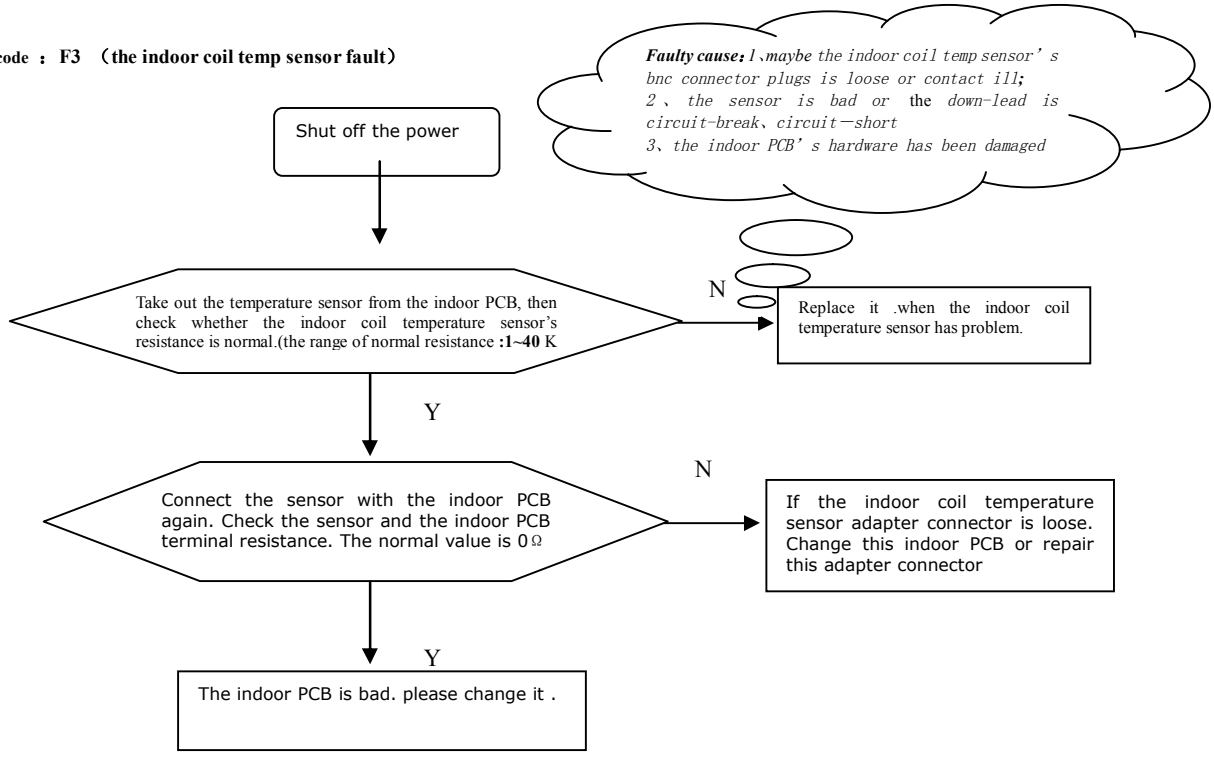

Fig. 5：the outdoor PCB

**Malfunction code：F2 （the indoor temp sensor fault）**

***Faulty cause：*** *1、maybe the indoor temp sensor's bnc connector plugs is loose or contact ill;*
*2、the sensor is bad or the down-lead is circuit-break、circuit—short*
*3、the indoor PCB's hardware has been damaged*


Turn off the power
Take out the temperature sensor from the indoor PCB, then check whether the indoor temperature sensor's resistance is normal.(the range of normal resistance :1~40 KΩ)
N
Please replace it .when the indoor temperature sensor has problem.
Y
Connect the sensor renewedly to the indoor PCB,, then check the resistance between the sensor and indoor PCB terminal. The normal resistance value is 0Ω
N
The indoor temperature sensor adapter connector breaks off, pls replace the indoor PCB or restore the adapter connector.
Y
The indoor PCB is bad，please change it

**Malfunction code ： F3 （the indoor coil temp sensor fault）**


Faulty cause: 1、maybe the indoor coil temp sensor's bnc connector plugs is loose or contact ill;
2、the sensor is bad or the down-lead is circuit-break、circuit—short
3、the indoor PCB's hardware has been damaged
Shut off the power
Take out the temperature sensor from the indoor PCB, then check whether the indoor coil temperature sensor's resistance is normal.(the range of normal resistance :1~40 K
N
Replace it .when the indoor coil temperature sensor has problem.
Y
Connect the sensor with the indoor PCB again. Check the sensor and the indoor PCB terminal resistance. The normal value is 0Ω
N
If the indoor coil temperature sensor adapter connector is loose. Change this indoor PCB or repair this adapter connector
Y
The indoor PCB is bad. please change it .

**Malfunction code：F4 （the indoor fan motor fault）**

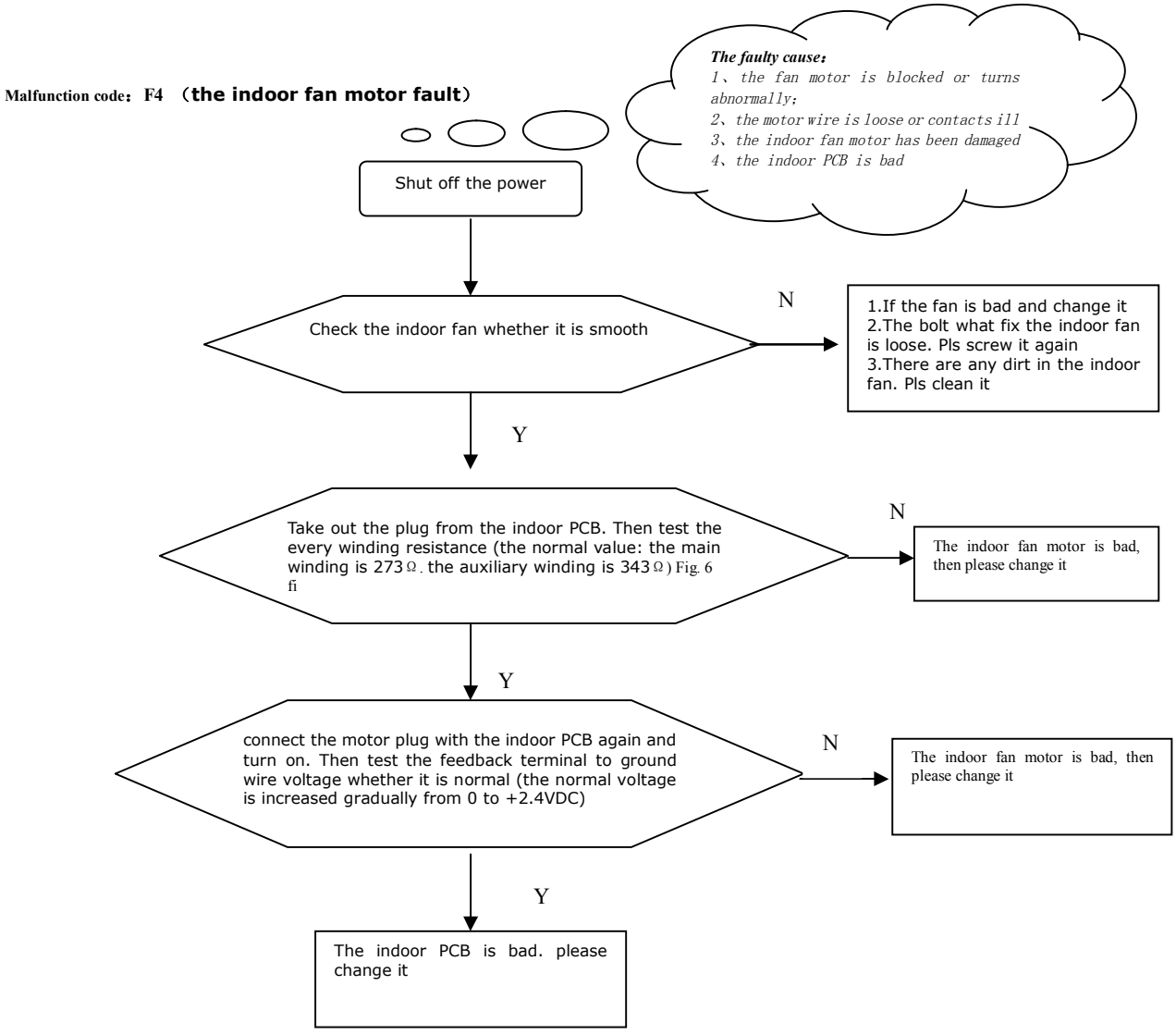
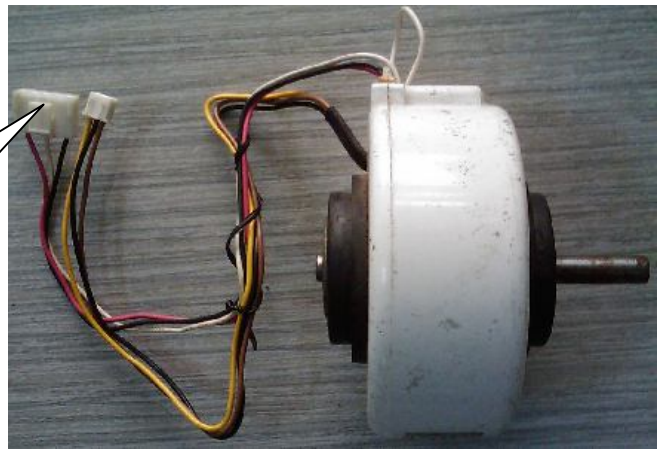

The faulty cause:
1、the fan motor is blocked or turns abnormally;
2、the motor wire is loose or contacts ill
3、the indoor fan motor has been damaged
4、the indoor PCB is bad
Shut off the power
Check the indoor fan whether it is smooth
N
1.If the fan is bad and change it
2.The bolt what fix the indoor fan is loose. Pls screw it again
3.There are any dirt in the indoor fan. Pls clean it
Y
Take out the plug from the indoor PCB. Then test the every winding resistance (the normal value: the main winding is 273Ω. the auxiliary winding is 343Ω) Fig. 6 fi
N
The indoor fan motor is bad, then please change it
Y
connect the motor plug with the indoor PCB again and turn on. Then test the feedback terminal to ground wire voltage whether it is normal (the normal voltage is increased gradually from 0 to +2.4VDC)
N
The indoor fan motor is bad, then please change it
Y
The indoor PCB is bad. please change it

Fig. 6、the indoor fan motor
The main winding resistance（the motor wire: black-white 273） the auxiliary winding resistance（the motor wire: red-white 343Ω）



**Malfunction code：F6 （the outdoor temp sensor fault）**

Faulty cause：1、maybe the indoor coil temp sensor's bnc connector plugs is loose or contact ill;
2、the sensor is bad or the down-lead is circuit-break、circuit—short
3、the indoor PCB's hardware has been damaged

Turn off the power

Take out the temperature sensor from outdoor PCB. Then test this outdoor temperature sensor resistance whether ii is normal (the normal: discharge sensor is 3K~200K the other sensor is 1K~40K).

N

The outdoor temp sensor is bad ,please change it.

Y

Connect the sensor with the indoor PCB again. Check the sensor and the indoor PCB terminal resistance. The normal value is 0Ω

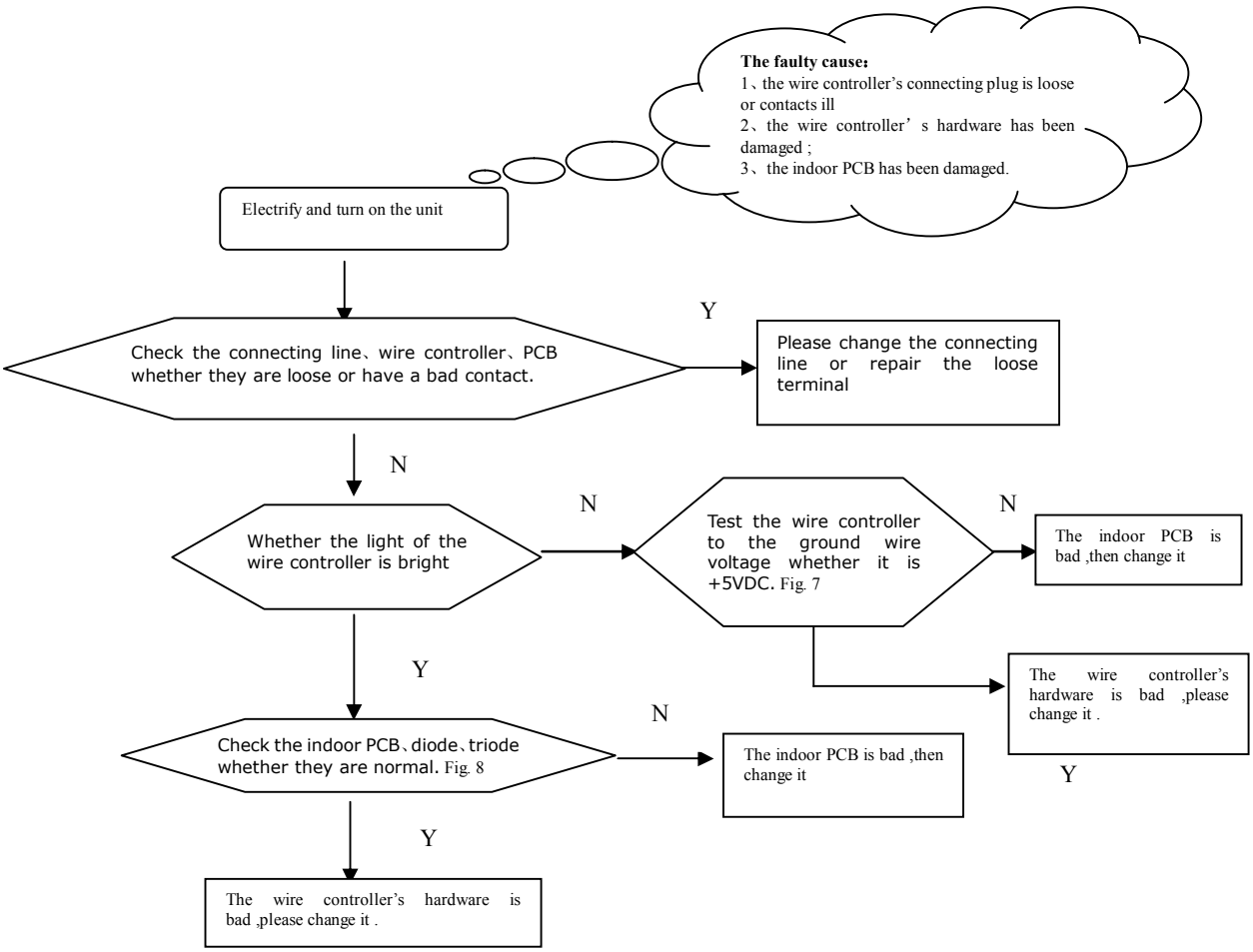
N

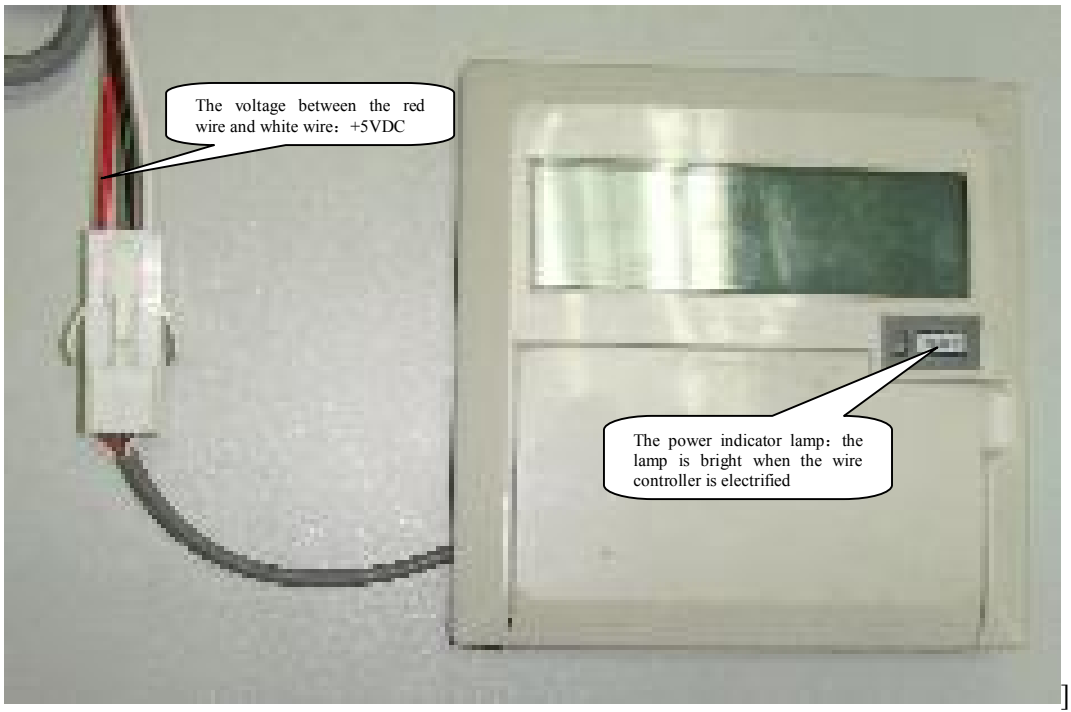
The indoor temperature sensor adapter connector is loose. Change this indoor PCB or repair this adapter connector

Y

The indoor PCB is bad. please change it

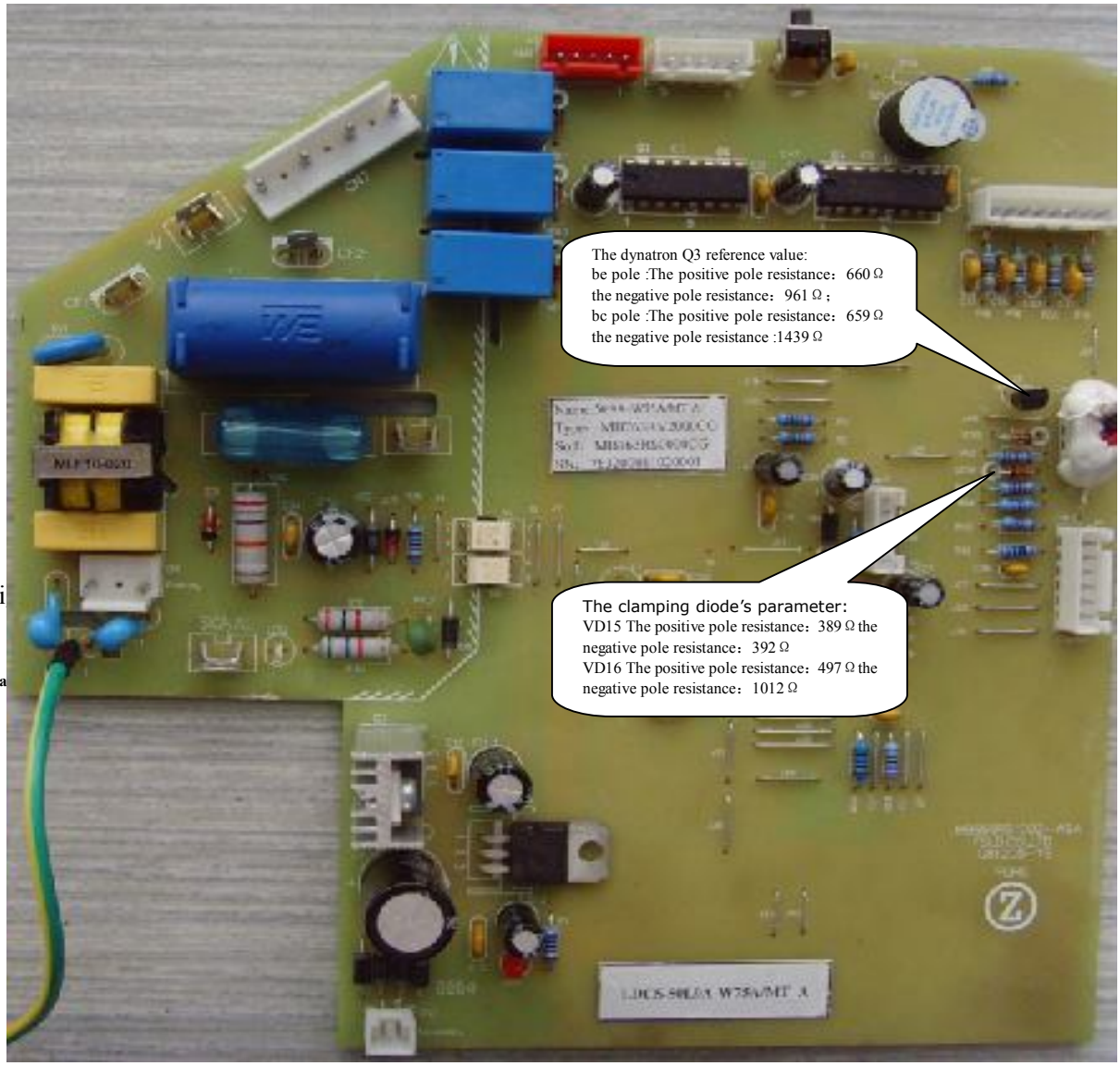
**Malfunction code ： FA （the communication fault between the wire controller to the indoor PCB）**


The faulty cause:
1、the wire controller's connecting plug is loose or contacts ill
2、the wire controller' s hardware has been damaged ;
3、the indoor PCB has been damaged.
Electrify and turn on the unit
Check the connecting line、wire controller、PCB whether they are loose or have a bad contact.
Y
Please change the connecting line or repair the loose terminal
N
Whether the light of the wire controller is bright
N
Test the wire controller to the ground wire voltage whether it is +5VDC. Fig. 7
N
The indoor PCB is bad ,then change it
The wire controller's hardware is bad ,please change it .
Y
Y
Check the indoor PCB、diode、triode whether they are normal. Fig. 8
N
The indoor PCB is bad ,then change it
Y
The wire controller's hardware is bad ,please change it .


The voltage between the red wire and white wire：+5VDC
The power indicator lamp：the lamp is bright when the wire controller is electrified

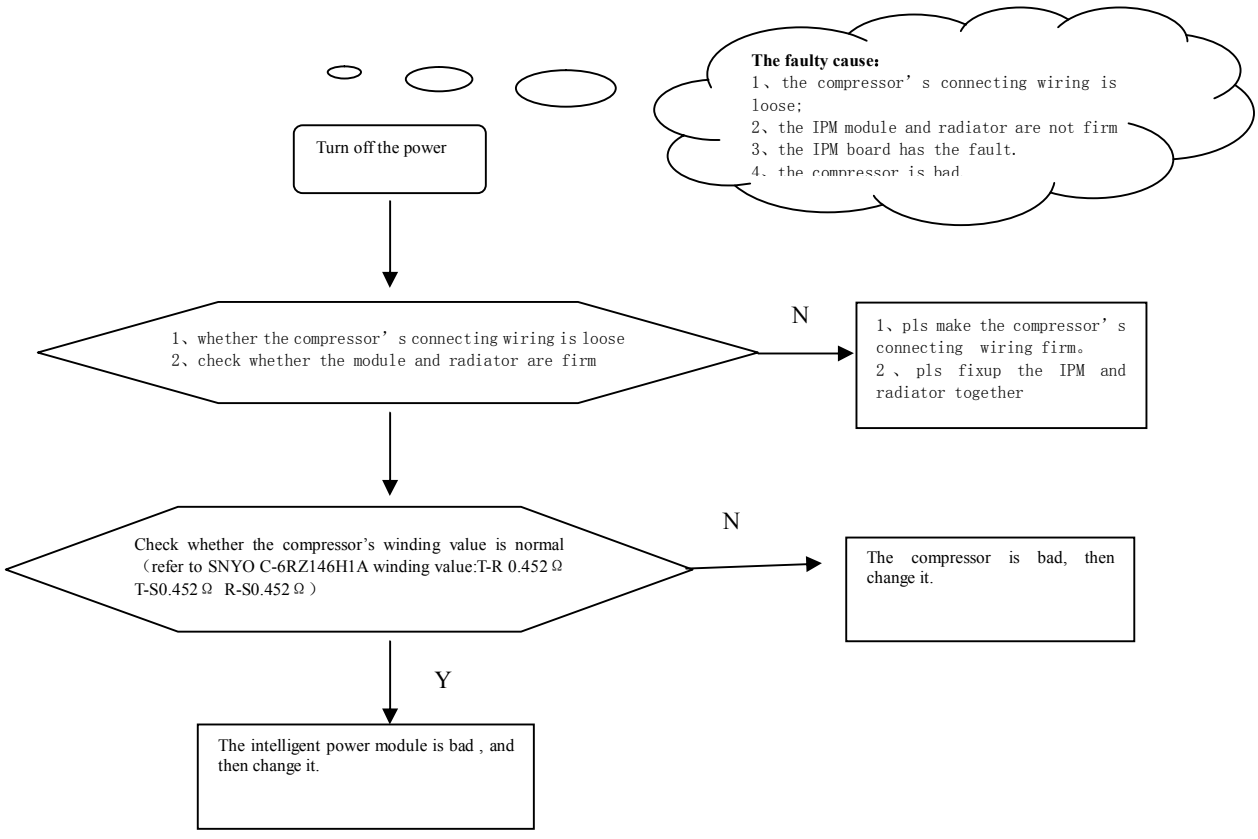
]

Fig. 7 the wire controller

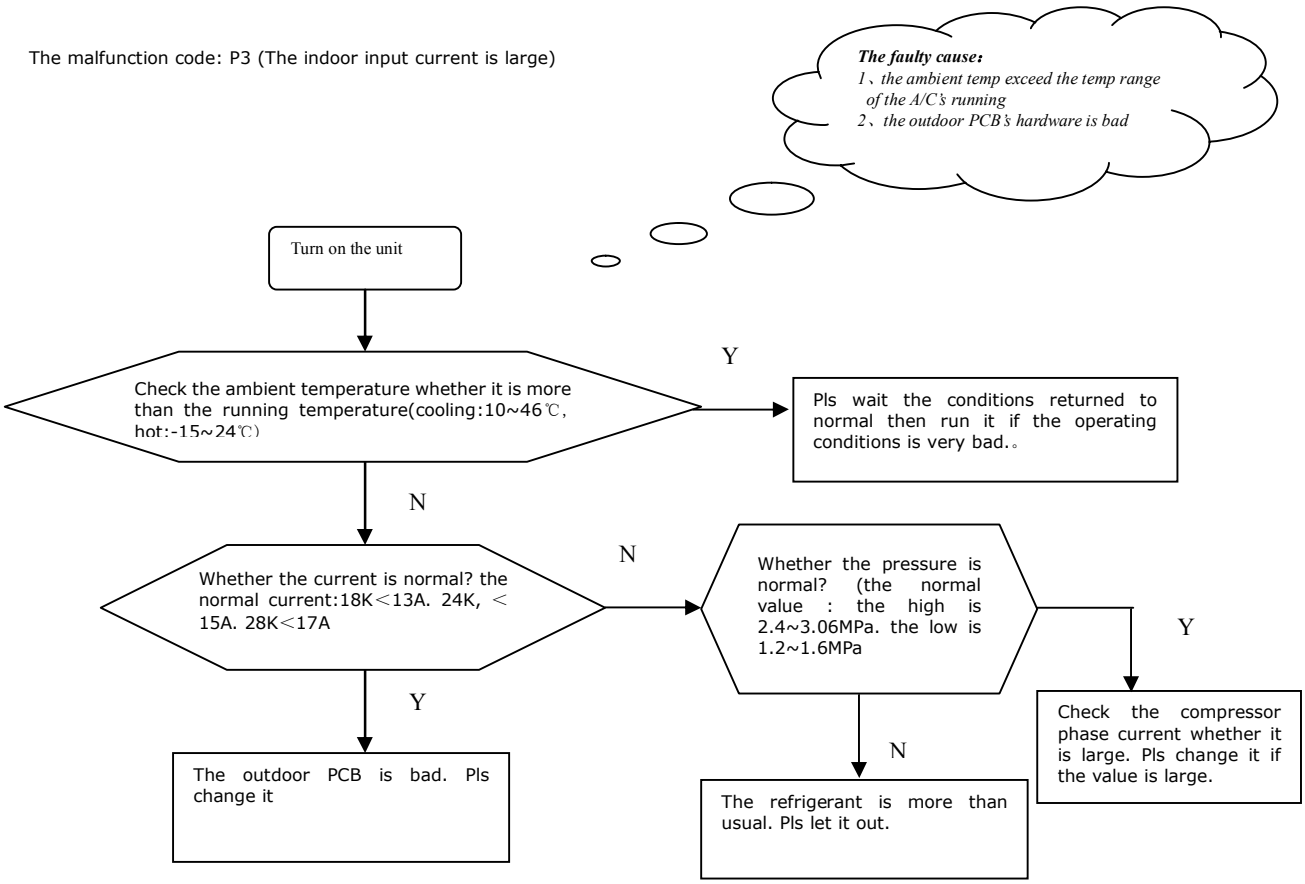

The dynatron Q3 reference value:
be pole :The positive pole resistance：660Ω
the negative pole resistance：961Ω；
bc pole :The positive pole resistance：659Ω
the negative pole resistance :1439Ω
The clamping diode's parameter:
VD15 The positive pole resistance：389Ω the negative pole resistance：392Ω
VD16 The positive pole resistance：497Ω the negative pole resistance：1012Ω

Fi

**Ma**

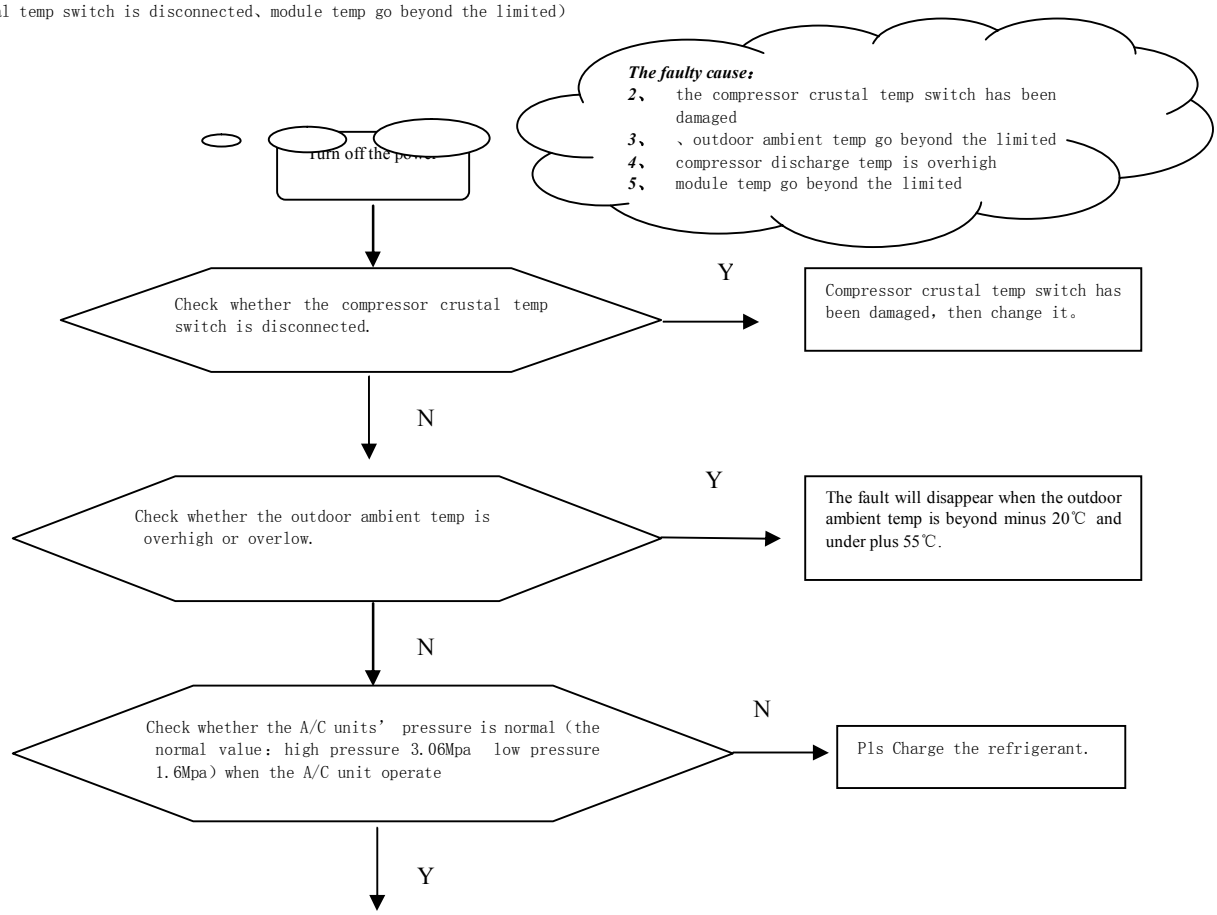

The faulty cause:
1、the compressor's connecting wiring is loose;
2、the IPM module and radiator are not firm
3、the IPM board has the fault.
4、the compressor is bad
Turn off the power
1、whether the compressor's connecting wiring is loose
2、check whether the module and radiator are firm
N
1、pls make the compressor's connecting wiring firm。
2、pls fixup the IPM and radiator together
Check whether the compressor's winding value is normal （refer to SNYO C-6RZ146H1A winding value:T-R 0.452Ω T-S0.452Ω R-S0.452Ω）
N
The compressor is bad, then change it.
Y
The intelligent power module is bad , and then change it.

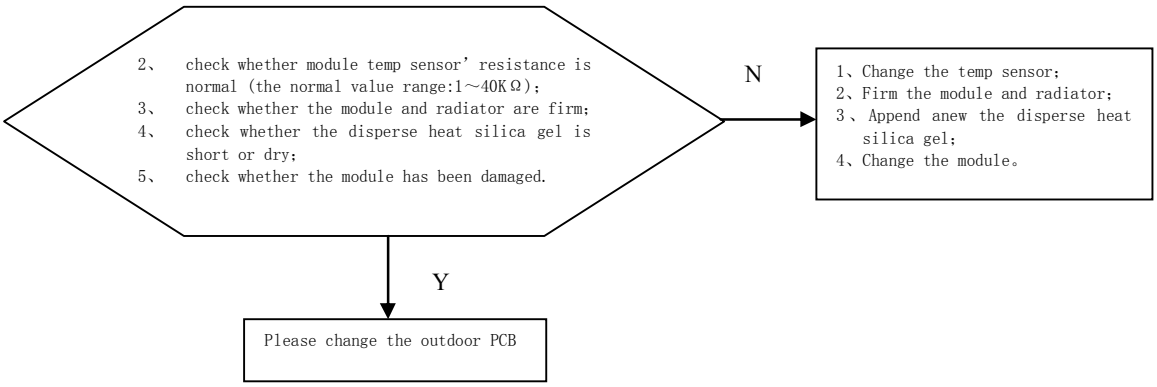
The malfunction code: P3 (The indoor input current is large)


The faulty cause:
1、the ambient temp exceed the temp range of the A/C's running
2、the outdoor PCB's hardware is bad
Turn on the unit
Check the ambient temperature whether it is more than the running temperature(cooling:10~46℃, hot:-15~24℃)
Y
Pls wait the conditions returned to normal then run it if the operating conditions is very bad.。
N
Whether the current is normal? the normal current:18K＜13A. 24K, ＜15A. 28K＜17A
N
Whether the pressure is normal? (the normal value : the high is 2.4~3.06MPa. the low is 1.2~1.6MPa
Y
Check the compressor phase current whether it is large. Pls change it if the value is large.
Y
The outdoor PCB is bad. Pls change it
N
The refrigerant is more than usual. Pls let it out.

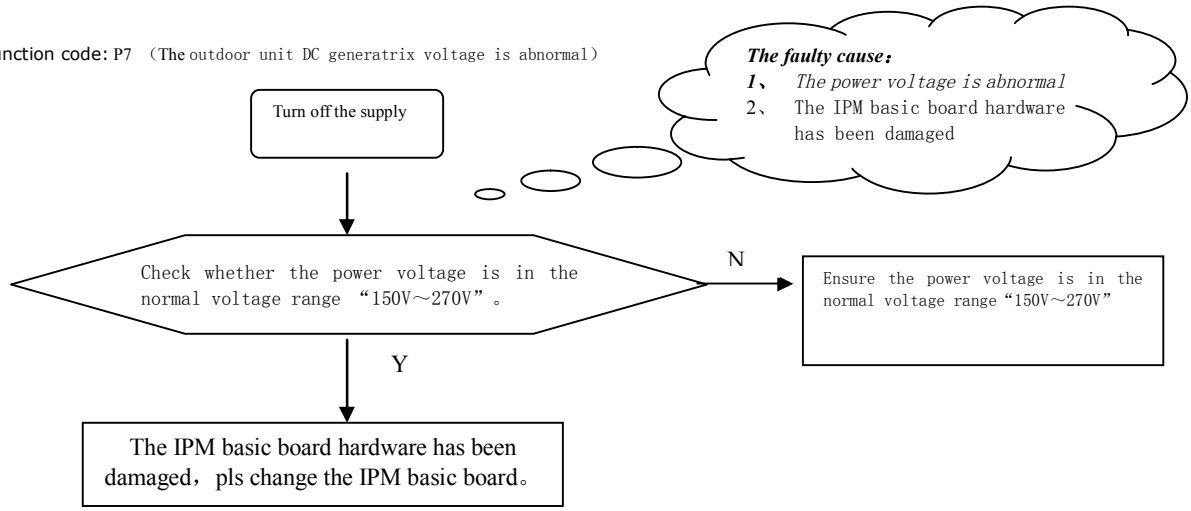
Annotation 1: The normal value of the phase current: 18K＜11A;24K＜13A;28K＜15A

The malfunction code:**P4** (compressor discharge temp is overhigh、outdoor ambient temp go beyond the limited、compressor crustal temp switch is disconnected、module temp go beyond the limited)

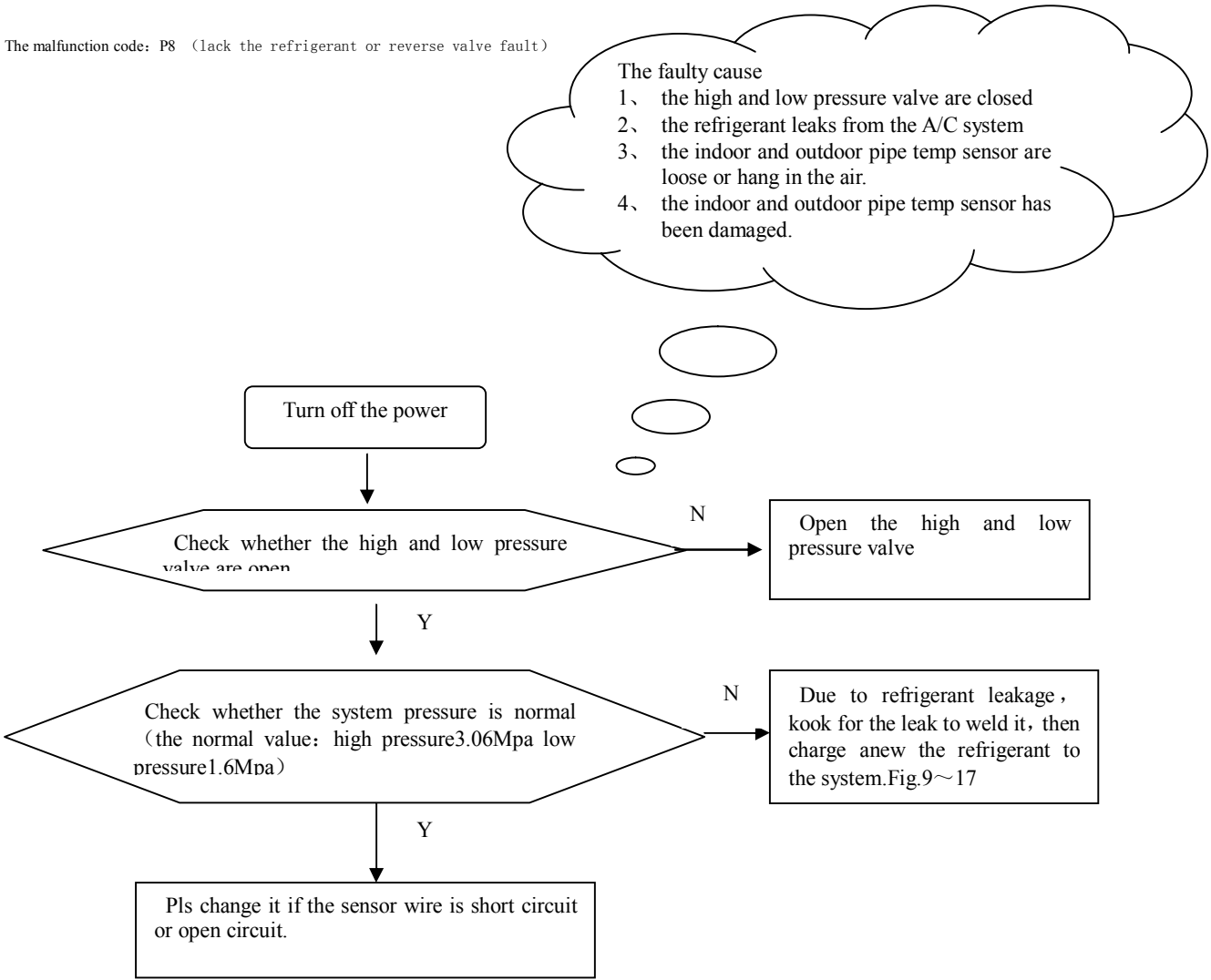

The faulty cause:
2、 the compressor crustal temp switch has been damaged
3、 、outdoor ambient temp go beyond the limited
4、 compressor discharge temp is overhigh
5、 module temp go beyond the limited
Turn off the power
Check whether the compressor crustal temp switch is disconnected.
Y
Compressor crustal temp switch has been damaged, then change it。
N
Check whether the outdoor ambient temp is overhigh or overlow.
Y
The fault will disappear when the outdoor ambient temp is beyond minus 20℃ and under plus 55℃.
N
Check whether the A/C units' pressure is normal (the normal value: high pressure 3.06Mpa low pressure 1.6Mpa) when the A/C unit operate
N
Pls Charge the refrigerant.
Y

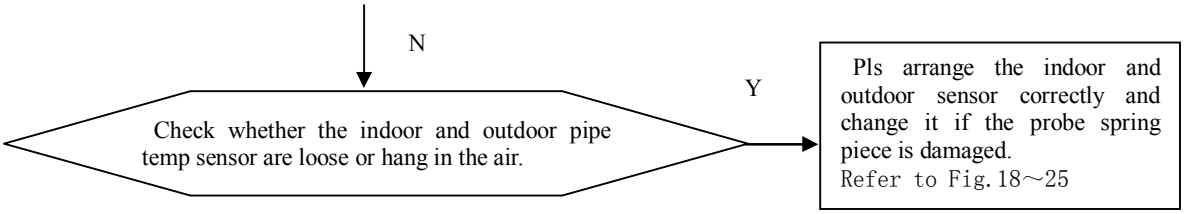

2、 check whether module temp sensor' resistance is normal (the normal value range:1～40KΩ);
3、 check whether the module and radiator are firm;
4、 check whether the disperse heat silica gel is short or dry;
5、 check whether the module has been damaged.
N
1、Change the temp sensor;
2、Firm the module and radiator;
3、Append anew the disperse heat silica gel;
4、Change the module。
Y
Please change the outdoor PCB

The malfunction code: P7 （The outdoor unit DC generatrix voltage is abnormal）


The faulty cause:
1、 The power voltage is abnormal
2、 The IPM basic board hardware has been damaged
Turn off the supply
Check whether the power voltage is in the normal voltage range "150V～270V"。
N
Ensure the power voltage is in the normal voltage range "150V～270V"
Y
The IPM basic board hardware has been damaged，pls change the IPM basic board。

The malfunction code：P8 （lack the refrigerant or reverse valve fault）


The faulty cause
1、 the high and low pressure valve are closed
2、 the refrigerant leaks from the A/C system
3、 the indoor and outdoor pipe temp sensor are loose or hang in the air.
4、 the indoor and outdoor pipe temp sensor has been damaged.
Turn off the power
Check whether the high and low pressure valve are open
N
Open the high and low pressure valve
Y
Check whether the system pressure is normal （the normal value：high pressure3.06Mpa low pressure1.6Mpa）
N
Due to refrigerant leakage，kook for the leak to weld it，then charge anew the refrigerant to the system.Fig.9～17
Y
Pls change it if the sensor wire is short circuit or open circuit.


N
Check whether the indoor and outdoor pipe temp sensor are loose or hang in the air.
Y
Pls arrange the indoor and outdoor sensor correctly and change it if the probe spring piece is damaged.
Refer to Fig.18～25

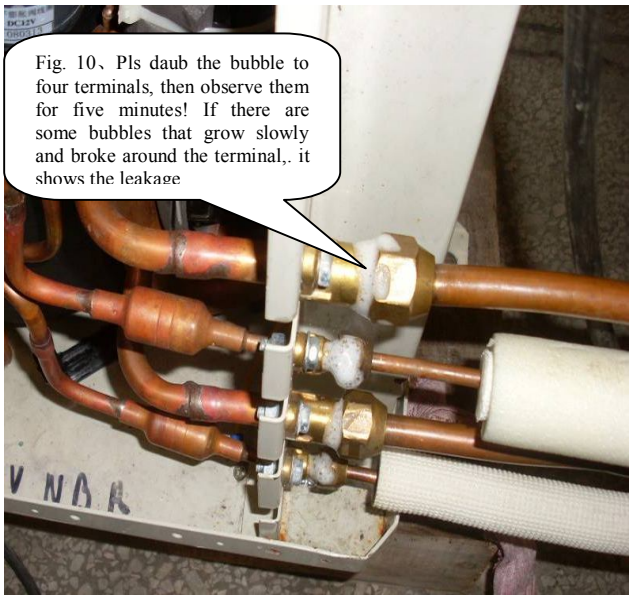
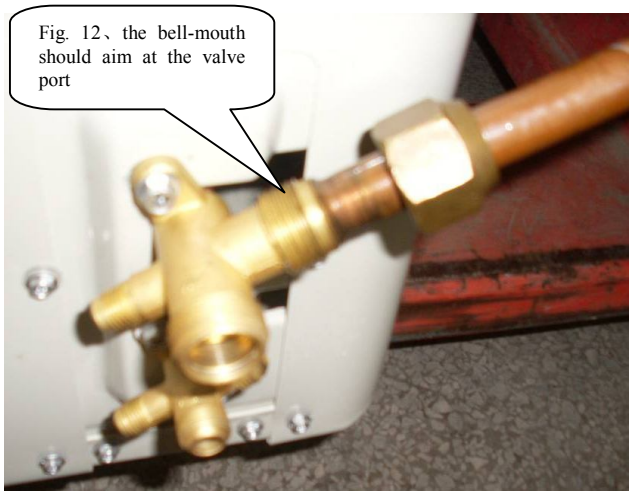
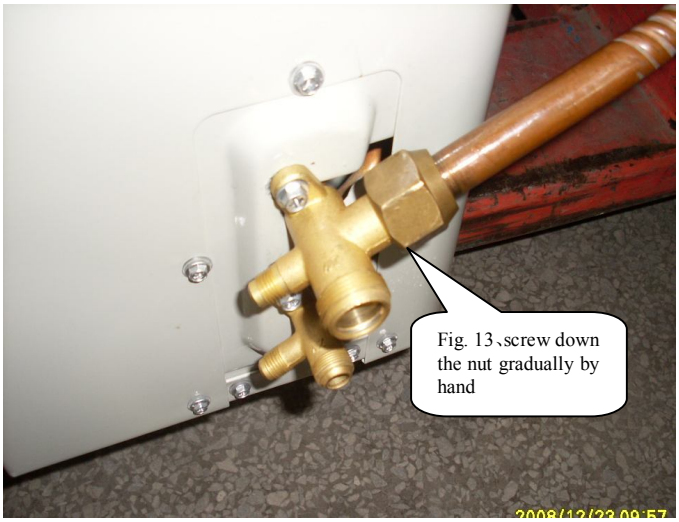


Fig. 10、Pls daub the bubble to four terminals, then observe them for five minutes! If there are some bubbles that grow slowly and broke around the terminal,. it shows the leakage

**Warning：please connecting the indoor and outdoor units according to the correct installing method，Fig. 11~15 show the right operating way；（Note：the indicator pictures aren't the real photos about the DC inverter dual zone unit）**





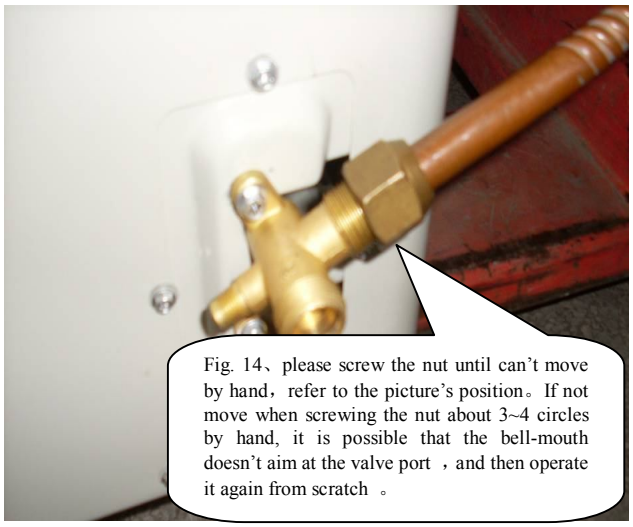
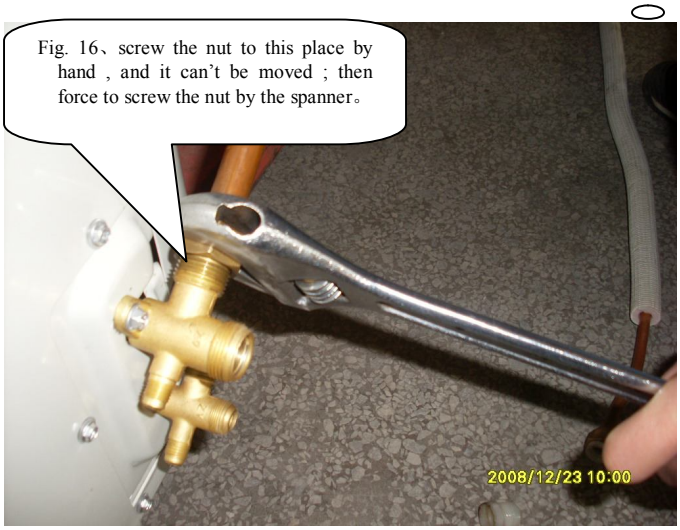



Fig. 14、please screw the nut until can't move by hand，refer to the picture's position。If not move when screwing the nut about 3~4 circles by hand, it is possible that the bell-mouth doesn't aim at the valve port ，and then operate it again from scratch 。

**The following pictures are the wrong operation. such as Fig. 16、Fig. 17**



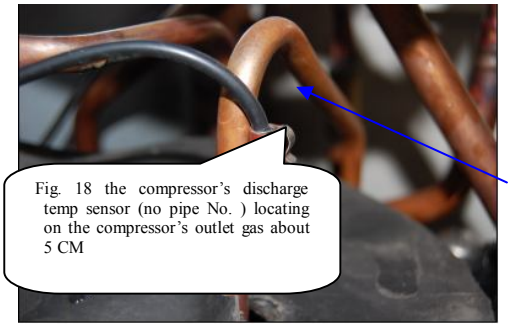
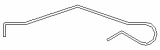


Fig. 18 the compressor's discharge temp sensor (no pipe No. ) locating on the compressor's outlet gas about 5 CM



The spring gasket

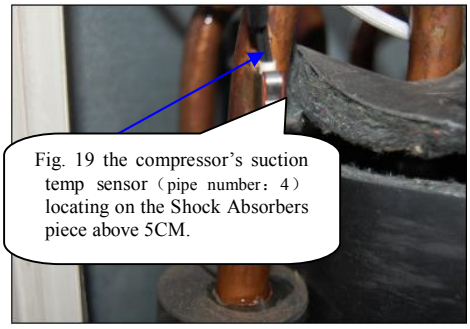


Fig. 19 the compressor's suction temp sensor（pipe number：4）locating on the Shock Absorbers piece above 5CM.

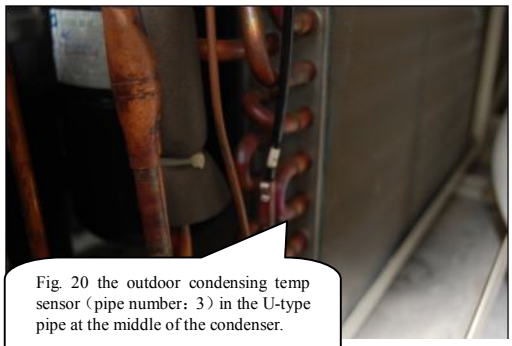


Fig. 20 the outdoor condensing temp sensor（pipe number：3）in the U-type pipe at the middle of the condenser.

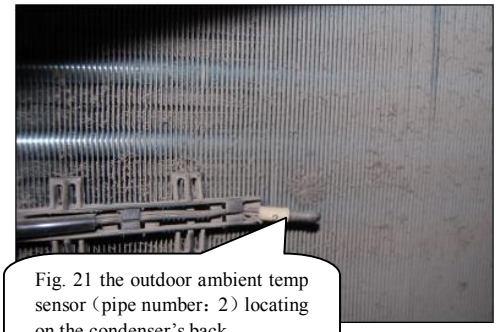
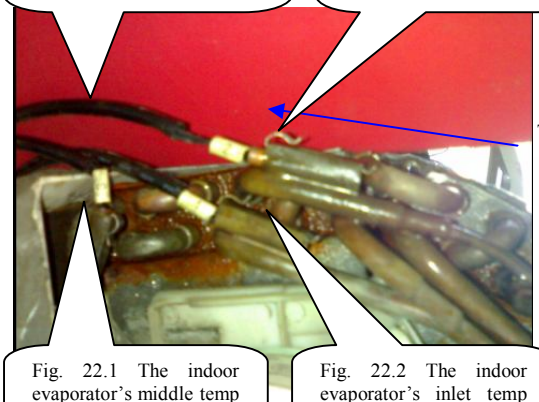


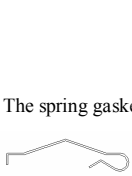
Fig. 21 the outdoor ambient temp sensor（pipe number：2）locating on the condenser's back，

Fig. 20 the outdoor condensing temp sensor（pipe number：3）in the U-type pipe at the middle of the condenser.

Fig. 22.3 The indoor evaporator's inlet temp sensor (pipe number: 2)



The spring gasket



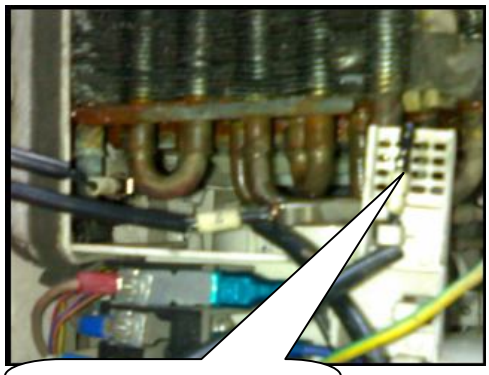


Fig. 22.1 The indoor evaporator's middle temp sensor (pipe number: 3)

Fig. 22.2 The indoor evaporator's inlet temp sensor (pipe number: 4)

Fig. 23 The indoor ambient temp sensor（pipe number：1）

Note: Apart from the ambient temperature sensor, all sensors must be equipped with spring washer, please check it by pic. If the angle is similar to Fig. 24, means that spring has lost its elasticity .please bend it to an angle of 135 degrees, Re. Fig. 8; Please ensure to install them if no spring washer,.

Fig. 24 The damaged spring gasket

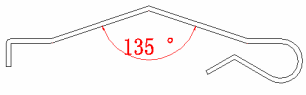



Fig. 25 The spring gasket is in good condition.

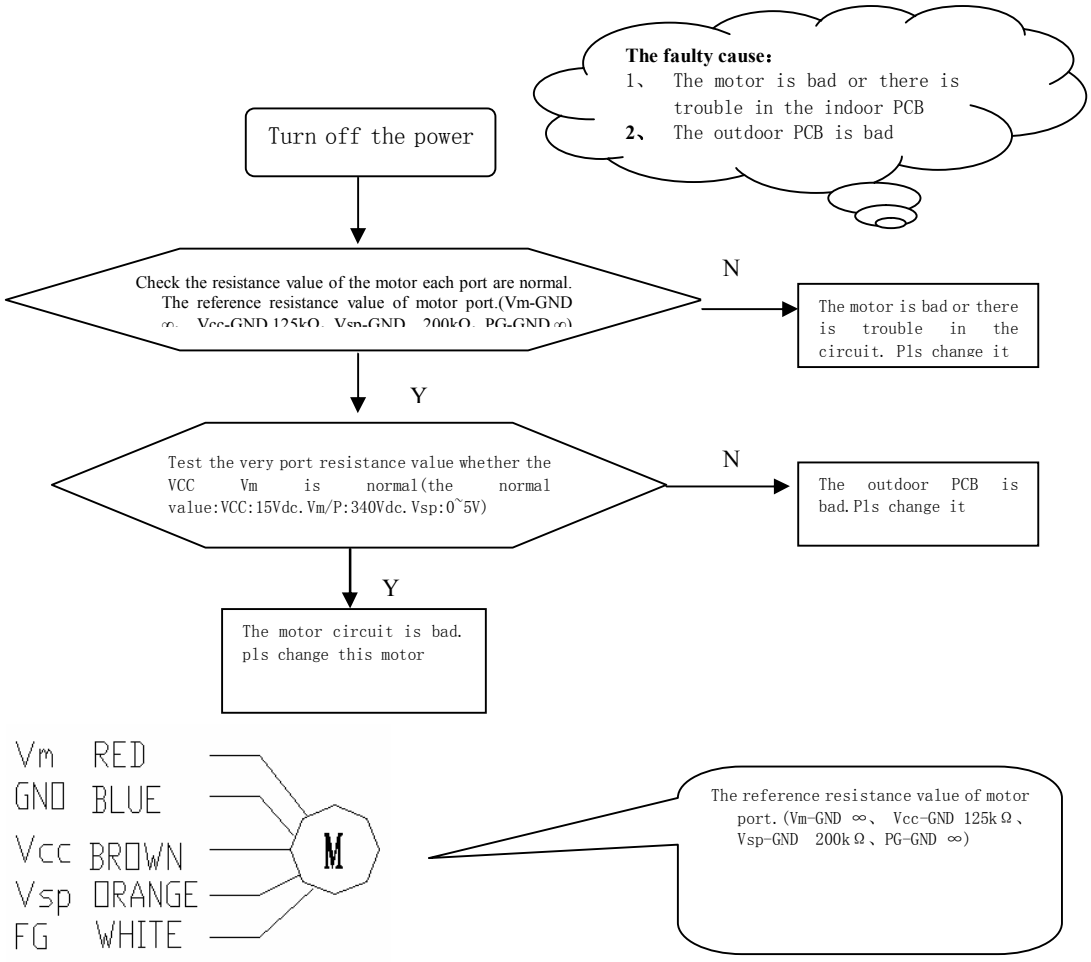
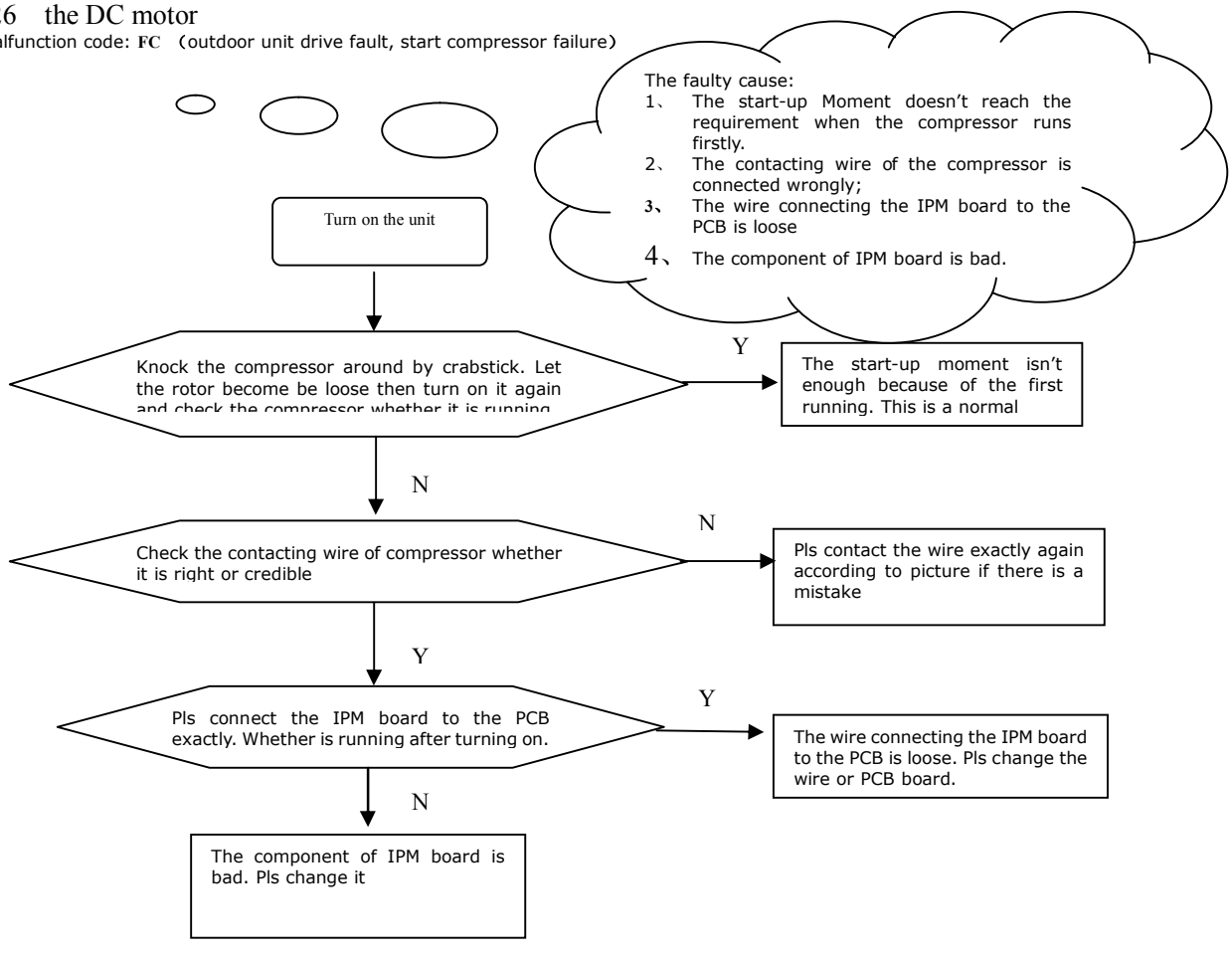

The faulty cause:
1、 The motor is bad or there is trouble in the indoor PCB
2、 The outdoor PCB is bad
Turn off the power
Check the resistance value of the motor each port are normal. The reference resistance value of motor port.(Vm-GND ∞、 Vcc-GND 125kΩ、 Vsp-GND 200kΩ、 PG-GND ∞)
N
The motor is bad or there is trouble in the circuit. Pls change it
Y
Test the very port resistance value whether the VCC Vm is normal(the normal value:VCC:15Vdc.Vm/P:340Vdc.Vsp:0~5V)
N
The outdoor PCB is bad.Pls change it
Y
The motor circuit is bad. pls change this motor
Vm RED
GND BLUE
Vcc BROWN
Vsp ORANGE
FG WHITE
M
The reference resistance value of motor port.(Vm-GND ∞、 Vcc-GND 125kΩ、 Vsp-GND 200kΩ、PG-GND ∞)

Fig. 26 the DC motor

The malfunction code: **FC** （outdoor unit drive fault, start compressor failure）


The faulty cause:
1、 The start-up Moment doesn't reach the requirement when the compressor runs firstly.
2、 The contacting wire of the compressor is connected wrongly;
3、 The wire connecting the IPM board to the PCB is loose
4、 The component of IPM board is bad.
Turn on the unit
Knock the compressor around by crabstick. Let the rotor become be loose then turn on it again and check the compressor whether it is running
Y
The start-up moment isn't enough because of the first running. This is a normal
N
Check the contacting wire of compressor whether it is right or credible
N
Pls contact the wire exactly again according to picture if there is a mistake
Y
Pls connect the IPM board to the PCB exactly. Whether is running after turning on.
Y
The wire connecting the IPM board to the PCB is loose. Pls change the wire or PCB board.
N
The component of IPM board is bad. Pls change it